Human Resources Development Canada
Développement des ressources humaines Canada

Occupational Analyses Series

Oil Burner Mechanic

1997

Canada

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Occupational Analyses Series

Oil Burner Mechanic

1997

Standards, Planning
and Analysis

Human Resources
Partnerships Directorate

Normes, planification
et analyse

Direction des partenariats
en ressources humaines

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The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this occupational analysis as the national standard for the occupation of oil burner mechanic.

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Ken Worthman	St-John's, Newfoundland

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OTHER RELATED OCCUPATIONAL TITLES

This analysis covers tasks performed by a oil burner mechanic whose occupational title has been identified by some provinces and territories of Canada under the following names:

Oil Burner Mechanic (Residential)
Oil Burner Repair
Residential Oil Burner Installation and Service

LIST OF PUBLISHED OCCUPATIONAL ANALYSES *

TITLE	NOC** Code
Aquaculture Technician (1977)	2221
Arts Administrator (1989)	0114
Automotive Painter (1995)	7322
Automotive Service Technician (1995)	7321
Automotive Technician - Automatic Transmission (1990)	7321
Automotive Technician - Electrical/Electronics (1992)	7321
Automotive Technician - Engine Repair and Fuel Systems (1989)	7321
Automotive Technician - Front-End (1989)	7321
Automotive Technician - Manual Transmission, Driveline and Brakes (1990)	7321
Aviation Machinist (1994)	7331
Baker (1991)	6252
Blaster (Surface) (1987)	7372
Boilermaker (1994)	7262
Bricklayer (1993)	7281
Cabinetmaker (1992)	7272
Carpenter (1993)	7271
Cement Finisher (1995)	7282
Construction Electrician (1994)	7241
Cook (1991)	6242
Electrical Mechanic (1981)	7333
Electronics Technician Vol. I (1986) (Video Equipment)	2242
Electronics Technician Vol. II (1986) (Audio Equipment)	2242

* **Red Seal analyses are indicated in bold**

** **National Occupational Classification**

Electronics Technician Vol. III (1986) (Computer Equipment)	2242
Electronics Technician Vol. IV (1986) (Office Equipment)	2242
Electronics Technician Vol. VI (1986) (Communication Equipment)	2242
Electronics Technician Vol. VII (1986) (Signaling Equipment)	2242
Electronics Technician Vol. VIII (1986) (Navigation Equipment)	2242
Electronics Technician Vol. IX (1986) (Video Game Equipment)	2242
Electronics Technician Vol. X (1987) (CADD Equipment)	2242
Electronics Technician Vol. XI (1987) (CAM Equipment)	2242
Electronics Technician Vol. XII (1987) (Robotics Equipment)	2242
Electronics Technician Vol. XIII (1987) (Biomedical and Laboratory Equipment)	2242
Electronics Technician Vol. XIV (1987) (Industrial Process-Control Equipment)	2243
Farm Equipment Mechanic (1994)	7312
Floorcovering Installer (1991)	7295
Glazier (1994)	7292
Hairstylist (1992)	6271
Heating (Gas and Oil) Servicer - Commercial and Industrial (1978)	7331
Heavy Equipment Mechanic (1987)	7312
Heavy Equipment Operator (1983)	7421
Industrial Electrician (1987)	7242
Industrial Instrument Mechanic (1988)	2243
Industrial Mechanic (Millwright) (1996)	7311
Insulator (Heat and Frost) (1993)	7293
Ironworker (Generalist) (1993)	7264
Lather (Interior Systems Mechanic) (1994)	7284

Logistics (1992)	0713
Machinist (1992)	7231
Major Electrical Appliance Repairer (1984)	7332
Mobile Crane Operator (1992)	7371
Motorcycle Mechanic (1995)	7334
Motor Vehicle Body Repairer (Metal and Paint) (1997)	7322
Motor Vehicle Repairer (Truck and Transport) (1983)	7321
New Home Builder and Residential Renovation Contractor (1992)	0712
Oil Burner Mechanic (1997)	7331
Painter and Decorator (1993)	7294
Partsperson (1995)	1472
Plumber (1996)	7251
Power Engineer (1997)	7351
Powerline Technician (1996)	7244
Refrigeration and Air Conditioning Mechanic (1997)	7313
Roofer (1991)	7291
Sheet Metal Worker (1990)	7261
Sprinkler System Installer (1995)	7252
Steamfitter-Pipefitter (1996)	7252
Steel Fabricator (Fitter) (1994)	7263
Tool and Die Maker (1992)	7232
Truck-Trailer Repairer (1994)	7321
Welder (1996)	7265

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Standards, Planning and Analysis Division
Human Resources Partnerships
Human Resources Development Canada
Place du Portage, Phase IV, 5th Floor
Hull, Quebec
K1A 0J9

FOREWORD

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources Development Canada sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA), to develop a series of occupational analyses.

The Occupational Analysis Program has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations;

- to identify those tasks that are performed by skilled workers in every province and territory;

- to develop instruments for use in the preparation of interprovincial standards "Red Seal" examinations and curricula for training leading to the certification of skilled workers;

- to facilitate the mobility, in Canada, of trainees and skilled workers; and

- to supply employers and employees, and their associations, industries, training institutions and governments with analyses of the tasks performed in particular occupations.

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GUIDE TO ANALYSIS

DEVELOPMENT OF ANALYSIS

A draft analysis is developed by a knowledgeable consultant who, with the assistance of a committee of industry experts in the field, identifies all the tasks performed in the occupation.

The draft is then assigned to occupational analysts at Human Resources Development Canada for review, translation and edit to ensure conformity with the nationally approved format.

The analysis is forwarded to provincial/territorial authorities for validation by specialists in the field. Their recommendations are assessed and incorporated into the final draft which also includes the identification of the common core tasks performed in the occupation.

The occupational analysis is published in both official languages.

STRUCTURE OF ANALYSIS

To facilitate the understanding of the nature of the occupation, the work performed is divided into the following divisions:

A. **BLOCK** - is the largest division within the analysis and reflects a distinct operation relevant to the occupation.

B. **TASK** - is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".

C. **SUB-TASK** - is the smallest division into which it is practical to sub-divide any work activity and, combined with others, fully describes all duties constituting a "TASK".

Enabling Objectives

The element of skill and knowledge that an individual must acquire to perform the task adequately.

Trend

Any shifts or changes in technology that affect the sub-tasks are identified under this heading.

VALIDATION METHOD

At the request of the Canadian Council of Directors of Apprenticeship (CCDA), the Standardization Sub-Committee developed a method for the validation of the national Red Seal occupational analyses.

A draft of the analysis is sent to all provinces/territories for validation. Each jurisdiction rates the sub-tasks and applies percentage ratings to blocks and tasks. This method for the validation of the national occupational analyses identifies common core tasks across Canada for a specific occupation. This feature facilitates the weighting of the Interprovincial Red Seal examinations.

DEFINITIONS

YES:	the sub-task is performed.
NO:	the sub-task is not performed.
BLOCK %:	the average time a worker spends performing each block in a given year in relation to other blocks of the analysis, taking into consideration the complexity (importance plus difficulty) of the block. (See Appendices "C" and "D" for numerical and graphical representations of this specific occupation.)
TASK %:	the average time a worker spends performing each task in relation to other tasks within the block, taking into consideration the complexity (importance plus difficulty) of the task. (See Appendix "C" for numerical representation of this specific occupation.)
NV:	Not Validated by the province/territory.
ND:	Not Designated in that province/territory.

COMMON CORE

The criteria for determining common core are dependant on the performance of sub-tasks. If 70% of the responding jurisdictions (excluding NVs and NDs) perform the sub-task, it shall be considered common core.

In the analysis, Block A is reserved for safety practices. Since safety practices are a mandatory feature of all occupations, it is considered common core and ratings are not required.

Interprovincial Red Seal examinations are based on the common core identified through this validation process.

SCOPE OF ANALYSIS

This analysis outlines the tasks and sub-tasks that a qualified oil burner mechanic will be required to perform in the trade. While the analysis covers all those tasks which a worker should be able to perform proficiently, anywhere in Canada, it should be remembered that the occupation will vary depending upon such factors as the location and size of the work project and local regulations that permit specific functions or services to be performed by other trades.

For the purpose of this analysis, an oil burner mechanic is required to have the knowledge, skill, and ability to:

- practice safety and maintain a safe work environment;
- install oil burning and oil-combination burning equipment and appliances (400,000 Btu and under), oil and oil-combination warm air heating appliances and waste oil burners;
- install fuel supply, necessary pumps, safety devices, piping, controls and gauges to oil burning equipment;
- service and maintain equipment and appliances regularly;
- troubleshoot, repair and replace burners, controls, and electrical, mechanical, venting or combustion/draft systems and components as well as a variety of related systems, such as hot water, steam, warm air, heat pumps, radiant heat, water conditioning and heating, ventilation and air-conditioning (HVAC) systems;
- evaluate requirements, plan for equipment and processes and retrofit existing equipment;
- follow written and oral instructions and complete necessary documentation requirements, including invoices, work orders, warranty forms, maintenance service records and travel lot sheets;
- interpret national and local codes, safety standards and practices, and the means of acquiring the required information;
- work in increasing complex situations because of technological advances, e.g. software controlled digital control systems, quality initiatives, e.g. ISO 9000, environmental issues, economic constraints, a variety of measurement systems, new materials, e.g. lightweight alloys in more fragile burners, and new equipment types, e.g. low pressure oil burners, hydronic heating systems and radiant appliances; and
- use effective interpersonal skills to communicate with the general public, related tradespeople and other stakeholders about the work required and performed.

OBSERVATIONS AND TRENDS ARISING FROM ANALYSIS

The skills that an oil burner mechanic requires are increasing. Technological and regulatory changes and improvements have rendered inadequate older methods and previous levels of knowledge.

Increased efficiency in systems, various types of materials and the trend to electronic and digital controls are significant technological changes for the practising oil burner mechanic.

Increasingly complex and stringent environmental laws have an impact on the job of an oil burner mechanic. The mechanic must be able to recognize potential and actual hazards and react to dangerous situations. The skill of containment is becoming more critical and environmental incident reporting procedures are new knowledge areas for the mechanic.

There are lesser impacts on the trade, although still vital. Economic adversity means that retrofitting, in an efficient and inexpensive manner, is becoming a more significant job task. As well, customers are asking for more input and advice on the selection of highly efficient and relatively inexpensive systems.

The North American Free Trade Agreement (NAFTA) is another potential impact on the trade. There is an opportunity for more work performed abroad, which will require new interpersonal skills for mechanics who may have to work in foreign cultures. Secondarily, the variety of manufacturers who will have products for sale will increase.

Another trend that may be significant is the influx of natural gas and propane into areas that have been exclusively oil based. This may result in a requirement for future training and upgrading.

ANALYSIS

BLOCK A SAFETY AND SAFE WORK PRACTICES

Task 1 **Practices safety and maintains a safe work environment.**

Trend: New environmental initiatives mean increased emphasis on safety and safety training.

	Sub-tasks	Enabling Objectives	Tools & Equipment
1.01	Evaluates work site conditions and identifies hazards.	knowledge of safe work practices and procedures	
		ability to recognize and counteract weather-related hazards such as ice and wind	
		knowledge of hazards associated with hoisting and rigging procedures	
		knowledge of hazards associated with various forms of welding	
1.02	Practices good housekeeping.	knowledge of proper storage procedures	
		ability to maintain a clean and orderly work area	
		ability to properly dispose of waste material	
1.03	Maintains tools in safe operating condition.	knowledge of proper storage of tools	
		knowledge of regular maintenance procedures and schedules	
		ability to recognize and report defects in equipment	
1.04	Uses and wears personal protection equipment.	knowledge of proper wearing of personal protective equipment	safety glasses, hard hat, welding helmet, ear plugs, face shield, dust mask, respirator, safety boots, gloves, fire

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of proper storage and maintenance of personal safety equipment	resistant clothing, safety harness, self-contained breathing apparatus, gas detection devices
1.05	Uses hand and power tools in a manner that ensures safety of self and others.	knowledge of safe work practices and procedures knowledge of regular maintenance procedures and schedules ability to recognize defects in equipment	hand tools, power tools
1.06	Works on scaffolds and ladders.	knowledge of hazards associated with working at heights	safety harness
1.07	Operates emergency safety equipment.	knowledge of locations of safety equipment knowledge of proper use of safety equipment	eye wash stations, fire extinguishers, stretcher/back board, ventilation equipment, fire blankets, self-contained breathing apparatus
1.08	Assures protection from fire hazard.	ability to recognize and report potential fire hazards knowledge of safe storage of combustible materials	
1.09	Assures protection from electrical shock.	knowledge of *Canadian Electrical Code* knowledge of safe work practices and procedures ability to follow lockout procedures	multimeter
1.10	Handles, stores and properly disposes of hazardous materials.	knowledge of Workplace Hazardous Materials Information System (WHMIS) regulations knowledge of environmental regulations	

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to contain liquid spills	
		ability to clean up liquid spills	
		knowledge of safe handling and storage of compressed gases	
1.11	Uses proper rigging and hoisting procedures.	knowledge of safe rigging and hoisting procedures	rigging equipment, tuggers, hoists, come-alongs
		knowledge of safe work practices and procedures	
1.12	Recognizes warning signs and danger tags.	knowledge of warning signs and danger tags	
		ability to interpret signs and tags	
1.13	Identifies and properly labels energized equipment.	ability to identify energized equipment	
		ability to interpret labels	
1.14	Applies cardiopulmonary resuscitation (CPR) and basic first aid.	knowledge of basic first aid procedures	first aid kit
		ability to use first aid equipment	
1.15	Observes limits of approach to high voltage equipment.	knowledge of approach limits	
1.16	Operates electrical testing equipment safely.	knowledge of *Canadian Electrical Code*	megohmmeter
		ability to use appropriate testing equipment	
		knowledge of safe work practices and procedures	
1.17	Operates powder actuated tools in safe manner.	knowledge of safe work practices and procedures	
		knowledge of equipment	

	Sub-tasks	Enabling Objectives	Tools & Equipment
1.18	Interprets government regulations and safety standards.	knowledge of Workers' Compensation Board regulations	
		knowledge of Occupational Health and Safety regulations (provincial and federal)	
		knowledge of WHMIS regulations	
		knowledge of environmental regulations	
		knowledge of local fire regulations	
		knowledge of government regulations for tank installation and inspection	
		knowledge of additional government regulations	
1.19	Complies with company safety regulations.	knowledge of company regulations	
		knowledge of company regulations for tank installation and inspection	
1.20	Completes written safety and injury reports.	knowledge of government and company regulations for reporting injuries	
		knowledge of consequences of non-compliance with reporting procedures	
1.21	Reports injuries to immediate supervisor.	knowledge of government and company regulations for reporting injuries	
		knowledge of consequences of non-compliance with reporting procedures	
1.22	Demonstrates safe work practice in all work activities.	ability to work with due consideration to the safety of fellow workers	
		ability to model safe working practice	
1.23	Uses gas detection devices.	ability to recognize hazardous situations	gas detection devices

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of the need for gas detection devices	
		knowledge of types of gas detection devices	
1.24	Works safely around pressurized components.	knowledge of pressurized components and vessels	pressure testing equipment
		ability to depressurize	
		ability to use pressure testing equipment	
1.25	Works safely with fuels.	knowledge of combustible situations	
		knowledge of explosive situations	
		knowledge of flashpoint	
		knowledge of flammability ranges	
		ability to follow procedures to eliminate dangers	
		knowledge of products	
1.26	Operates motor vehicles.	knowledge of vehicle controls	
		knowledge of provincial/territorial vehicle laws	
		knowledge of company regulations for vehicles	
1.27	Notifies officials of spills and initiates containment.	ability to use containment kits	
1.28	Recognizes and responds to air quality environmental concerns.	knowledge of air quality indicators	
1.29	Performs all tasks in a safe, competent and professional manner.	knowledge of codes and regulations	
		knowledge of manufacturer's specifications	

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of safe working practices	
	knowledge of environmental regulations	

BLOCK B INSTALLATION OF OIL BURNING AND OIL-COMBINATION BURNING EQUIPMENT AND APPLIANCES

Task 2 Installs oil liquid medium heating appliances.

Trend: Equipment will tend to be of greater fuel efficiency and greater performance. Burners are more complex and greater knowledge and expertise are required for set-up. Flow requirements to the appliance are much more critical. Installers must be more cognizant of advances in technology.

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.01	Determines British thermal unit (Btu) requirements for application.	ability to perform heat loss calculations	calculator, combustion analyzer kit
		ability to calculate fuel heating values	
		ability to determine appliance efficiency	
		ability to perform heat transfer calculations	
		knowledge of elevations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.02	Evaluates location of installation.	knowledge of codes and regulations knowledge of equipment specifications	tape measure, code books

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.03	Evaluates suitability of oil burner appliance to installation.	knowledge of types and values of equipment knowledge of equipment characteristics ability to communicate effectively	sales and technical brochures

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.04	Consults with customer on choice of appliance.	knowledge of types and values of equipment knowledge of equipment characteristics ability to communicate effectively	sales and technical brochures

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.05	Prepares materials list to satisfy installation requirements.	knowledge of codes and regulations knowledge of material compatibilities knowledge of system requirements knowledge of product accessibility	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.06	Prepares site for proper installation of appliance.	knowledge of codes and regulations knowledge of manufacturer's specifications ability to coordinate with other trades	tape measure, level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.07	Verifies adequate supply of air to support combustion.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of air supply allowances for R2000 structures	calculator, tape measure

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.08	Lays out installation in accordance with standards and codes.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of after-installation serviceability ability to prepare working drawings ability to interpret blueprints knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.09	Assembles equipment and materials on site.	knowledge of safe working practices	hand cart

Sub-tasks					Enabling Objectives						Tools & Equipment	
					ability to coordinate assembly of equipment and materials with installation sequence ability to read and interpret blueprints and diagrams							
NF	NS	PE	NB		PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes		ND	ND	ND	ND	ND	ND	NV	yes
2.10	Assembles appliance according to manufacturer's specifications.				ability to interpret manufacturer's specifications knowledge of safe working practices						screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder	
NF	NS	PE	NB		PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes		ND	ND	ND	ND	ND	ND	NV	yes
2.11	Positions appliance.				ability to read and interpret blueprints knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe rigging practices						come-along, pry bar, crane, rigging equipment	
NF	NS	PE	NB		PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes		ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.12	Squares and levels appliance.	ability to use hand tools	level, tape measure, plumb bob

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.13	Performs pressure test of appliance.	ability to perform pressure test knowledge of working pressures knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of safe working practices	pressure gauge, hydrostatic pump, pipe wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.14	Repairs or replaces appliance or components.	ability to interpret pressure test results ability to determine appropriate corrective measures knowledge of safe working practices	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.15	Coordinates installation of required services with other trades.	ability to communicate effectively knowledge of work of related trades	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.16	Connects appliance to electrical service.	knowledge of basic wiring practices knowledge of relevant electrical code ability to perform terminations knowledge of safe working practices	pliers, screwdriver, voltmeter, amp probe, multimeter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	no	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.17	Connects appliance to water system.	ability to perform proper piping practices knowledge of relevant plumbing codes knowledge of safe working practices ability to solder	pipe wrench, pipe cutters, soldering torch, solder, pipe threader

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.18	Installs side wall venting.	knowledge of safe working practices knowledge of codes	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	no

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.19	Verifies adequate venting capacity of chimney.	knowledge of safe working practices knowledge of codes knowledge of venting requirements	draft gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.20	Connects appliance to venting system.	knowledge of venting requirements knowledge of codes and appliance requirements knowledge of trade practices knowledge of safe working practices	tin snips, tape measure, drill, screwdriver, level, crimping tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.21	Connects appliance to fuel supply.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of trade practices ability to thread, cut, measure and flare pipes knowledge of safe working practices	pipe cutters, flaring tools, tube bender, basic hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.22	Fills appliance with appropriate heating medium.	knowledge of working pressure of boilers knowledge of water treatment	pressure gauge, vacuum gauge, hand tools, hydrometer, pump

Sub-tasks		Enabling Objectives	Tools & Equipment
		knowledge of codes and regulations	
		knowledge of safe working practices	
		ability to vent a system	
		knowledge of pressure valves	
		knowledge of manufacturer's specifications	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.23	Tests sequence and operation of all controls.	knowledge of manufacturer's specifications	multimeter, basic hand tools
		knowledge of electrical controls	
		knowledge of electrical circuits	
		ability to read and interpret schematics	
		ability to read meters and testing equipment	
		knowledge of codes and regulations	
		ability to understand proper control operation	
		knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.24	Verifies adequate fuel supply and pressure to burner.	knowledge of safe working practices	pressure gauge, vacuum gauge, basic hand tools
		knowledge of codes and regulations	

Sub-tasks					Enabling Objectives						Tools & Equipment	
					knowledge of manufacturer's specifications							
					knowledge of burner operation							
					knowledge of sequence of operation							
					knowledge of basic combustion							
					ability to install and read pressure gauge							
					ability to install and read vacuum gauge							
					knowledge of fuel distribution system							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes	
2.25	Starts burner according to manufacturer's recommendations.				knowledge of safe working practices						basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure	
					knowledge of manufacturer's specifications							
					knowledge of codes and regulations							
					knowledge of basic combustion							
					knowledge of burner operation							
					knowledge of flame safeguard testing							
					knowledge of sequence of operation and controls							
					ability to bleed fuel pump							
					ability to check and adjust burner controls and components							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes	

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.26	Adjusts and calibrates burner for proper operation, using approved testing equipment and combustion analysis techniques.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components ability to use CO_2 efficiency analyzer	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure, CO_2 efficiency analyzer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.27	Tests installation for safe and proper operation.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of complete heating system knowledge of sequence of operation knowledge of control limits	basic hand tools, multimeter, pyrometer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.28	Explains operation of appliance to customer/operator.	knowledge of heating system knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe working practices ability to communicate effectively	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

2.29	Completes required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 3 **Installs oil-combination liquid medium heating appliances.**

Trend: Equipment will tend to be of greater fuel efficiency and greater performance. Burners are more complex and greater knowledge and expertise are required for set-up. Flow requirements to the appliance are much more critical. Installers must be more cognizant of advances in technology.

	Sub-tasks	Enabling Objectives	Tools & Equipment
3.01	Determines Btu requirements for application.	ability to perform heat loss calculations ability to calculate fuel heating values	calculator, combustion analyzer kit

Sub-tasks		Enabling Objectives	Tools & Equipment
		ability to determine appliance efficiency	
		ability to perform heat transfer calculations	
		knowledge of elevations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.02	Evaluates location of installation.	knowledge of codes and regulations knowledge of equipment specifications	tape measure, code books

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.03	Evaluates suitability of oil burner appliance to installation.	knowledge of types and values of equipment knowledge of equipment characteristics ability to communicate effectively	sales and technical brochures

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.04	Consults with customer on choice of appliance.	knowledge of types and values of equipment knowledge of equipment characteristics ability to communicate effectively	sales and technical brochures

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
3.05	Prepares materials list to satisfy installation requirements.	knowledge of codes and regulations knowledge of material compatibilities knowledge of system requirements knowledge of product accessibility	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.06	Prepares site for proper installation of appliance.	knowledge of codes and regulations knowledge of manufacturer's specifications ability to coordinate with other trades	tape measure, level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.07	Verifies adequate supply of air to support combustion.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of air supply allowances for R2000 structures	calculator, tape measure

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.08	Lays out installation in accordance with standards and codes.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of after-installation serviceability	

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to prepare working drawings ability to interpret blueprints knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.09	Assembles equipment and materials on site.	knowledge of safe working practices ability to coordinate assembly of equipment and materials with installation sequence ability to read and interpret blueprints and diagrams	hand cart

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.10	Assembles appliance according to manufacturer's specifications.	ability to interpret manufacturer's specifications knowledge of safe working practices	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
3.11	Positions appliance.	ability to read and interpret blueprints knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe rigging practices	come-along, pry bar, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.12	Squares and levels appliance.	ability to use hand tools	level, tape measure, plumb bob

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.13	Performs pressure test of appliance.	ability to perform pressure test knowledge of working pressures knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of safe working practices	pressure gauge, hydrostatic pump, pipe wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.14	Repairs or replaces appliance or components.	ability to interpret pressure test results ability to determine appropriate corrective measures	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of safe working practices	tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.15	Coordinates installation of required services with other trades.	ability to communicate effectively knowledge of work of related trades	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.16	Connects appliance to electrical service.	knowledge of basic wiring practices knowledge of relevant electrical code ability to perform terminations knowledge of safe working practices	pliers, screwdriver, voltmeter, amp probe, multimeter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	no	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.17	Connects appliance to water system.	ability to perform proper piping practices knowledge of relevant plumbing codes knowledge of safe working practices	pipe wrench, pipe cutters, soldering torch, solder, pipe threader

Sub-tasks				Enabling Objectives						Tools & Equipment	
				ability to solder							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
3.18	Installs side wall venting.			knowledge of safe working practices knowledge of codes							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
no	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
3.19	Verifies adequate venting capacity of chimney.			knowledge of safe working practices knowledge of codes knowledge of venting requirements							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
3.20	Connects appliance to venting system.			knowledge of venting requirements knowledge of codes and appliance requirements knowledge of trade practices knowledge of safe working practices						tin snips, tape measure, drill, screwdriver, level, crimping tools	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
3.21	Connects appliance to fuel supply.			knowledge of codes and regulations knowledge of manufacturer's specifications						pipe cutters, flaring tools, tube bender, basic hand tools	

Sub-tasks		Enabling Objectives	Tools & Equipment
		knowledge of trade practices ability to thread, cut, measure and flare pipes knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.22	Fills appliance with appropriate heating medium.	knowledge of working pressure of boilers knowledge of water treatment knowledge of codes and regulations knowledge of safe working practices ability to vent a system knowledge of pressure valves knowledge of manufacturer's specifications	pressure gauge, vacuum gauge, hand tools, hydrometer, pump

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.23	Tests sequence and operation of all controls.	knowledge of manufacturer's specifications knowledge of electrical controls knowledge of electrical circuits ability to read and interpret schematics ability to read meters and testing equipment	multimeter, basic hand tools

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of codes and regulations ability to understand proper control operation knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.24	Verifies adequate fuel supply and pressure to burner.	knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of burner operation knowledge of sequence of operation knowledge of basic combustion ability to install and read pressure gauge ability to install and read vacuum gauge knowledge of fuel distribution system	pressure gauge, vacuum gauge, basic hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.25	Starts burner according to manufacturer's recommendations.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of burner operation	
	knowledge of flame safeguard testing	
	knowledge of sequence of operation and controls	
	ability to bleed fuel pump	
	ability to check and adjust burner controls and components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.26	Adjusts and calibrates burner for proper operation, using approved testing equipment and combustion analysis techniques.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components ability to use CO_2 efficiency analyzer	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure, CO_2 efficiency analyzer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
3.27	Tests installation for safe and proper operation.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of complete heating system knowledge of sequence of operation knowledge of control limits	basic hand tools, multimeter, pyrometer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.28	Explains operation of appliance to customer/operator.	knowledge of heating system knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe working practices ability to communicate effectively	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

3.29	Completes required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 4 **Installs oil warm air heating appliances.**

Trend: Design of sealed combustion chambers and higher efficiency burners provide better energy conservation throughout the industry. Controls are easier to operate, but are more difficult to troubleshoot and repair. There is a greater requirement to understand the close tolerances that are necessary for better fuel economy. There is an increased necessity to understand the concepts in induced and/or forced draft venting. Venting procedures are changing radically, making oil-burning heating appliances more economical for the consumer. Knowledge of proper disposal methods of condensates is essential.

	Sub-tasks	Enabling Objectives	Tools & Equipment
4.01	Determines Btu requirements for application.	ability to perform heat loss calculations ability to calculate fuel heating values ability to determine appliance efficiency ability to perform heat transfer calculations knowledge of elevations	calculator, combustion analyzer kit

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.02	Evaluates location of installation.	knowledge of codes and regulations knowledge of equipment specifications	tape measure, code books

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.03	Consults with customer on choice of appliance.	knowledge of types and values of equipment knowledge of equipment characteristics	sales and technical brochures

Sub-tasks				Enabling Objectives						Tools & Equipment	
				ability to communicate effectively							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
4.04	Prepares materials list to satisfy installation requirements.			knowledge of codes and regulations knowledge of material compatibilities knowledge of system requirements knowledge of product accessibility							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
4.05	Prepares site for proper installation of appliance.			knowledge of codes and regulations knowledge of manufacturer's specifications ability to coordinate with other trades						tape measure, level	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
4.06	Verifies adequate supply of air to support combustion.			knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of air supply allowances for R2000 structures						calculator, tape measure	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
4.07	Lays out installation in accordance with standards and codes.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe working practices knowledge of after-installation serviceability ability to prepare working drawings ability to interpret blueprints	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.08	Assembles equipment and materials on site.	knowledge of safe working practices ability to coordinate assembly of equipment and materials with installation sequence ability to read and interpret blueprints and diagrams	hand cart

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.09	Assembles appliance according to manufacturer's specifications.	ability to interpret manufacturer's specifications knowledge of safe working practices	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along,

	Sub-tasks	Enabling Objectives	Tools & Equipment
			A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.10	Positions appliance.	ability to read and interpret blueprints knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe rigging practices	come-along, pry bar, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.11	Squares and levels appliance.	ability to use hand tools	level, tape measure, plumb bob

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.12	Coordinates installation of required services with other trades.	ability to communicate effectively knowledge of work of related trades	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.13	Connects appliance to electrical service.	knowledge of basic wiring practices knowledge of relevant electrical code	pliers, screwdriver, voltmeter, amp probe, multimeter

Sub-tasks				Enabling Objectives						Tools & Equipment	
				ability to perform terminations							
				knowledge of safe working practices							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	no	yes	ND	ND	ND	ND	ND	ND	NV	yes
4.14	Connects appliance to venting system.			knowledge of venting requirements						tin snips, tape measure, drill, screwdriver, level, crimping tools	
				knowledge of codes and regulations							
				knowledge of trade practices							
				knowledge of safe working practices							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
4.15	Connects appliance to fuel supply.			knowledge of codes and regulations						pipe cutters, flaring tools, tube bender, basic hand tools	
				knowledge of manufacturer's specifications							
				knowledge of trade practices							
				ability to thread, cut, measure pipe and flare tubing							
				knowledge of safe working practices							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
4.16	Tests sequence and operation of all controls.			knowledge of manufacturer's specifications						multimeter, basic hand tools	
				knowledge of electrical controls							
				knowledge of electrical circuits							

Sub-tasks	Enabling Objectives	Tools & Equipment
	ability to read and interpret schematics	
	ability to read meters and testing equipment	
	knowledge of codes and regulations	
	ability to understand proper control operation	
	knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.17	Verifies adequate fuel supply to burner.	knowledge of safe working practices	pressure gauge, vacuum gauge, basic hand tools
		knowledge of codes and regulations	
		knowledge of manufacturer's specifications	
		knowledge of burner operation	
		knowledge of sequence of operation	
		knowledge of basic combustion	
		ability to install and read pressure gauge	
		ability to install and read vacuum gauge	
		knowledge of fuel distribution system	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
4.18	Starts burner according to manufacturer's recommendations.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.19	Adjusts and calibrates burner for proper operation.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure, CO_2 efficiency analyzer

Sub-tasks	Enabling Objectives	Tools & Equipment
	ability to use CO_2 efficiency analyzer	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.20	Tests, adjusts and balances blower system.	knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications ability to adjust pulleys and belts knowledge of static pressures	straight edge, tachometer, manometer, velometer, magnehelic gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	no

4.21	Installs power humidifiers and electrostatic air cleaners.	knowledge of safe working practices knowledge of codes and regulations

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.22	Installs side wall venting.	knowledge of safe working practices knowledge of codes and regulations

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.23	Balances air volume.	knowledge of manufacturer's specifications	air velocity meter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	no

	Sub-tasks	Enabling Objectives	Tools & Equipment
4.24	Tests installation for safe and proper operation.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of complete heating system knowledge of sequence of operation knowledge of control limits	basic hand tools, multimeter, pyrometer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.25	Explains operation of appliance to customer/operator.	knowledge of heating system knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe working practices ability to communicate effectively	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

4.26	Completes all required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 5 **Installs oil-combination warm air heating appliances.**

Trend: Design of sealed combustion chambers and higher efficiency burners provide better energy conservation throughout the industry. Controls are easier to operate, but are more difficult to troubleshoot and repair. There is a greater requirement to understand the close tolerances that are necessary for better fuel economy. There is an increased necessity to understand the concepts in induced and/or forced draft venting. Venting procedures are changing radically, making oil-burning heating appliances more economical for the consumer. Knowledge of proper disposal methods of condensates is essential.

	Sub-tasks	Enabling Objectives	Tools & Equipment
5.01	Determines Btu requirements for application.	ability to perform heat loss calculations ability to calculate fuel heating values ability to determine appliance efficiency ability to perform heat transfer calculations knowledge of elevations	calculator, combustion analyzer kit, charts, slide rules

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.02	Evaluates location of installation.	knowledge of codes and regulations knowledge of equipment specifications	tape measure, code books

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.03	Consults with customer on choice of appliance.	knowledge of types and values of equipment knowledge of equipment characteristics	sales and technical brochures

	Sub-tasks	Enabling Objectives	Tools & Equipment

ability to communicate effectively

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.04 Prepares materials list to satisfy installation requirements.

knowledge of codes and regulations

knowledge of material capabilities

knowledge of system requirements

knowledge of product accessibility

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.05 Prepares site for proper installation of appliance.

knowledge of codes and regulations — tape measure, level

knowledge of manufacturer's specifications

ability to coordinate with other trades

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.06 Verifies adequate supply of air to support combustion.

knowledge of codes and regulations — calculator, tape measure

knowledge of manufacturer's specifications

knowledge of air supply allowances for R2000 structures

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
5.07	Lays out installation in accordance with standards and codes.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe working practices knowledge of after-installation serviceability ability to prepare working drawings ability to interpret blueprints	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.08	Assembles equipment and materials on site.	knowledge of safe working practices ability to coordinate assembly of equipment and materials with installation sequence ability to read and interpret blueprints and diagrams	hand cart

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.09	Assembles appliance according to manufacturer's specifications.	ability to interpret manufacturer's specifications knowledge of safe working practices	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along,

	Sub-tasks	Enabling Objectives	Tools & Equipment
			A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.10	Positions appliance.	ability to read and interpret blueprints knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe rigging practices	come-along, pry bar, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.11	Squares and levels appliance.	ability to use hand tools	level, tape measure, plumb bob

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.12	Coordinates installation of required services with other trades.	ability to communicate effectively knowledge of work of related trades	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.13	Connects appliance to electrical service.	knowledge of basic wiring practices knowledge of relevant electrical code	pliers, screwdriver, voltmeter, amp probe, multimeter

Sub-tasks					Enabling Objectives						Tools & Equipment	
					ability to perform terminations knowledge of safe working practices							
NF	NS	PE	NB		PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	no	yes		ND	ND	ND	ND	ND	ND	NV	yes
5.14	Connects appliance to venting system.				knowledge of venting requirements knowledge of codes and regulations knowledge of trade practices knowledge of safe working practices						tin snips, tape measure, drill, screwdriver, level, crimping tools	
NF	NS	PE	NB		PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes		ND	ND	ND	ND	ND	ND	NV	yes
5.15	Connects appliance to fuel supply.				knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of trade practices ability to thread, cut, measure pipe and flare tubing knowledge of safe working practices						pipe cutters, flaring tools, tube bender, basic hand tools	
NF	NS	PE	NB		PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes		ND	ND	ND	ND	ND	ND	NV	yes
5.16	Tests sequence and operation of all controls.				knowledge of manufacturer's specifications knowledge of electrical controls knowledge of electrical circuits						multimeter, basic hand tools	

Sub-tasks	Enabling Objectives	Tools & Equipment
	ability to read and interpret schematics	
	ability to read meters and testing equipment	
	knowledge of codes and regulations	
	ability to understand proper control operation	
	knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.17	Verifies adequate fuel supply to burner.	knowledge of safe working practices	pressure gauge, vacuum gauge, basic hand tools
		knowledge of codes and regulations	
		knowledge of manufacturer's specifications	
		knowledge of burner operation	
		knowledge of sequence of operation	
		knowledge of basic combustion	
		ability to install and read pressure gauge	
		ability to install and read vacuum gauge	
		knowledge of fuel distribution system	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
5.18	Starts burner according to manufacturer's recommendations.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.19	Adjusts and calibrates burner for proper operation.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure, CO_2 efficiency analyzer

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to use CO_2 efficiency analyzer	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.20	Tests, adjusts and balances blower system.	knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications ability to adjust pulleys and belts knowledge of static pressures	straight edge, tachometer, manometer, velometer, magnehelic gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	no

5.21	Installs power humidifiers and electrostatic air cleaners.	knowledge of safe working practices knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.22	Installs side wall venting.	knowledge of safe working practices knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
no	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.23	Balances air volume.	knowledge of manufacturer's specifications	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	no

	Sub-tasks	Enabling Objectives	Tools & Equipment
5.24	Tests installation for safe and proper operation.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of complete heating system knowledge of sequence of operation knowledge of control limits	basic hand tools, multimeter, pyrometer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.25	Explains operation of appliance to customer/operator.	knowledge of heating system knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe working practices ability to communicate effectively	air velocity meter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

5.26	Completes all required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 6 **Installs waste oil burners.**

Trend: Product improvements, environmental considerations and cost of disposal alternatives will probably lead to increased usage. Technological advances will likely follow. Unique skills and knowledge are required for servicing waste oil burners.

	Sub-tasks	Enabling Objectives	Tools & Equipment
6.01	Determines appropriate size of burner to meet customer requirements.	knowledge of equipment specifications knowledge of manufacturer's specifications knowledge of volume of waste oil ability to perform heat loss calculations ability to calculate fuel heating values ability to determine appliance efficiency ability to perform heat transfer calculations knowledge of environmental regulations	calculator, combustion analyzer kit, charts, slide rules

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.02	Evaluates location of installation.	knowledge of codes and regulations knowledge of equipment specifications knowledge of environmental regulations	tape measure, code books

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
6.03	Prepares materials list to satisfy installation requirements.	knowledge of codes and regulations knowledge of material compatibilities knowledge of system requirements knowledge of product accessibility knowledge of environmental regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.04	Prepares site for proper installation of equipment.	knowledge of codes and regulations knowledge of environmental regulations knowledge of manufacturer's specifications ability to coordinate with other trades	tape measure, level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.05	Verifies adequate supply of air to support combustion.	knowledge of codes and regulations knowledge of manufacturer's specifications	calculator, tape measure

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.06	Lays out installation in accordance with standards and codes.	knowledge of codes and regulations knowledge of environmental regulations	

Sub-tasks				Enabling Objectives						Tools & Equipment
				knowledge of manufacturer's specifications						
				knowledge of after-installation serviceability						
				ability to prepare working drawings						
				ability to interpret blueprints						
				knowledge of safe working practices						

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.07	Assembles equipment and materials on site.	knowledge of safe working practices		hand cart	
		knowledge of environmental regulations			
		ability to coordinate assembly of equipment and materials with installation sequence			
		ability to read and interpret blueprints and diagrams			

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.08	Assembles appliance according to manufacturer's specifications.	ability to interpret manufacturer's specifications	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along,
		knowledge of safe working practices	
		knowledge of environmental regulations	

	Sub-tasks	Enabling Objectives	Tools & Equipment
			A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.09	Positions appliance.	ability to read and interpret blueprints knowledge of safe working practices knowledge of codes and regulations knowledge of environmental regulations knowledge of manufacturer's specifications knowledge of safe rigging practices	come-along, pry bar, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.10	Squares and levels appliance.	ability to use hand tools	level, tape measure, plumb bob

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.11	Coordinates installation of required services with other trades.	ability to communicate effectively knowledge of work of related trades	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.12	Connects appliance to electrical service.	knowledge of safe working practices	pliers, screwdriver,

Sub-tasks				Enabling Objectives				Tools & Equipment
				knowledge of basic wiring practices				voltmeter, amp probe, multimeter
				knowledge of relevant electrical code				
				ability to perform terminations				
				(NOT COMMON CORE)				

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	no	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.13	Connects appliance to venting system.			knowledge of safe working practices						tin snips, tape measure, drill, screwdriver, level, crimping tools	
				knowledge of venting requirements							
				knowledge of codes and regulations							
				knowledge of trade practices							

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.14	Connects appliance to fuel supply.			knowledge of codes and regulations						pipe cutters, flaring tools, tube bender, basic hand tools	
				knowledge of manufacturer's specifications							
				knowledge of trade practices							
				ability to thread, cut, measure and flare pipes							
				knowledge of environmental regulations							
				knowledge of safe working practices							

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
6.15	Connects appliance to special air supply as required by manufacturer.	knowledge of manufacturer's specifications knowledge of safe working practices ability to connect pneumatic piping	basic plumbing tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.16	Tests sequence and operation of all controls.	knowledge of manufacturer's specifications knowledge of electrical controls knowledge of electrical circuits ability to read and interpret schematics ability to read meters and testing equipment knowledge of codes and regulations ability to understand proper control operation knowledge of safe working practices	multimeter, basic hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.17	Verifies adequate fuel supply and pressure to burner.	knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of burner operation	pressure gauge, vacuum gauge, basic hand tools

Sub-tasks				Enabling Objectives				Tools & Equipment
				knowledge of sequence of operation knowledge of basic combustion ability to install and read pressure gauge ability to install and read vacuum gauge knowledge of fuel distribution system				

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.18	Starts burner according to manufacturer's recommendations.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure, flame mirror

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.19	Adjusts and calibrates burner for proper operation.	knowledge of safe working practices	basic hand tools, combustion analysis kit, flame signal meter,

Sub-tasks					Enabling Objectives						Tools & Equipment	
					knowledge of manufacturer's specifications						multimeter, steel ruler, tape measure	
					knowledge of codes and regulations							
					knowledge of basic combustion							
					knowledge of burner operation							
					knowledge of flame safeguard testing							
					knowledge of sequence of operation and controls							
					ability to bleed fuel pump							
					ability to check and adjust burner controls and components							
	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
	yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
6.20	Tests installation for safe and proper operation.				knowledge of safe working practices						basic hand tools, multimeter, pyrometer	
					knowledge of manufacturer's specifications							
					knowledge of codes and regulations							
					knowledge of complete heating system							
					knowledge of sequence of operation							
					knowledge of control limits							
	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
	yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
6.21	Tests, adjusts and balances blower assembly.				knowledge of safe working practices						straight edge, tachometer, manometer,	
					knowledge of codes and regulations							

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of manufacturer's specifications	velometer, magnehelic *gauge, velocity meter*
		ability to adjust pulleys and belts	
		knowledge of static pressures	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.22	Explains operation and safety features of appliance to customer.	knowledge of heating system
		knowledge of codes and regulations
		knowledge of manufacturer's specifications
		knowledge of safe working practices
		ability to communicate effectively

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

6.23	Explains hazards of waste oil and foreign materials to customer.	knowledge of heating system
		knowledge of codes and regulations
		knowledge of manufacturer's specifications
		knowledge of safe working practices
		ability to communicate effectively

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Sub-tasks		Enabling Objectives	Tools & Equipment
6.24	Explains and demonstrates routine appliance maintenance requirements to customer.	knowledge of manufacturer's maintenance regulations and specifications knowledge of hazards of using improper fuels ability to communicate effectively ability to explain and demonstrate maintenance tasks	basic hand tools, vacuum, wire brush, scraper

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Sub-tasks		Enabling Objectives	Tools & Equipment
6.25	Completes all required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 7 **Installs fuel supply to oil burning equipment.**

Trend: Increased awareness of environmental codes and regulations is required to competently perform this task. There is greater prevalence of aboveground storage systems. Technical advances have made fuel storage and supply systems safer but more expensive. New systems are more commonly made of composites rather than base metals.

Sub-tasks		Enabling Objectives	Tools & Equipment
7.01	Determines fuel consumption requirements of oil burning system.	knowledge of appliance specifications knowledge of friction loss	

Sub-tasks		Enabling Objectives	Tools & Equipment
		knowledge of pipe sizing	
		knowledge of pressure drop and pressure loss	
		ability to make calculations	
		knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.02	Determines fuel storage requirements.	knowledge of details of specification application	calculator, tape measure
		knowledge of customer's requirements	
		knowledge of fuel availability	
		knowledge of environmental regulations	
		knowledge of safe working practices	
		knowledge of codes and regulations	
		ability to calculate tank size	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.03	Determines appropriate fuel storage location.	knowledge of environmental regulations	
		ability to determine safe location of storage	
		knowledge of soil and ground water conditions	

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.04	Determines appropriate fuel distribution system for application.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe working practices knowledge of piping systems knowledge of elevation detail knowledge of environmental regulations ability to read and interpret blueprints and drawings	calculator

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.05	Designs fuel distribution plan for approval.	ability to draft knowledge of piping systems knowledge of codes and regulations ability to design plans in accordance with applicable codes	drafting tool

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	no	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
7.06	Prepares materials list to satisfy installation requirements.	knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of system requirements	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.07	Prepares site for proper installation of fuel distribution equipment.	ability to read elevations knowledge of product accessibility ability to coordinate with other trades knowledge of environmental regulations knowledge of existing services	transit level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.08	Determines proper pump and pipe capacities to satisfy fuel supply requirements.	knowledge of manufacturer's specifications knowledge of pipe sizes knowledge of oil flow rates knowledge of pump designs knowledge of mean temperatures knowledge of codes and regulations ability to perform flow rate calculations	calculator, charts

Sub-tasks	Enabling Objectives	Tools & Equipment

ability to read and interpret blueprints

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.09 Lays out installation in accordance with standards and codes.

knowledge of codes and regulations

knowledge of manufacturer's specifications

knowledge of safe working practices

ability to interpret blueprints

knowledge of environmental regulations

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.10 Assembles equipment and materials on site.

knowledge of safe working practices

knowledge of environmental regulations

ability to read and interpret blueprints and diagrams

ability to coordinate assembly of equipment and materials with installation sequence

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.11 Performs visual inspection of all components.

knowledge of proper configurations

knowledge of codes and regulations

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of manufacturer's specifications	
	knowledge of welds	
	knowledge of tank protection	
	ability to recognize defects	
	ability to inspect tank	
	ability to read and interpret blueprints and specifications	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.12	Positions and installs fuel storage tank according to code and local environmental regulations.	ability to read and interpret blueprints knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of safe rigging practices	come-along, pry bar, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.13	Installs piping.	knowledge of codes and regulations knowledge of standard piping practices	pipe-fitting tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
7.14	Performs appropriate testing procedures on tanks and piping.	knowledge of manufacturer's specifications knowledge of codes and regulations	megohmmeter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.15	Installs safety devices.	knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of safe working practices knowledge of basic trade practices knowledge of control and operation of valves ability to test the switching action of controls	basic hand tools, multimeter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.16	Completes piping connections.	ability to perform proper piping practices knowledge of relevant plumbing codes knowledge of safe working practices ability to solder	pipe wrench, pipe cutters, soldering torch, solder, pipe threader

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
7.17	Checks storage tanks.	ability to coordinate fuel supply with supplier knowledge of fuel grades knowledge of mean temperatures knowledge of manufacturer's specifications ability to match fuel requirements to geographical location knowledge of safe working practices	hand pump

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.18	Purges and checks fuel distribution system.	knowledge of safe working practices knowledge of environmental regulations knowledge of flushing procedures ability to check for leaks	ohmmeter, basic hand tools, pressure gauge, vacuum gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.19	Tests, adjusts and balances fuel distribution system.	knowledge of manufacturer's specifications knowledge of safe working practices knowledge of codes and regulations knowledge of flow rates knowledge of head pressure	basic hand tool, vacuum pressure gauge, flowmeter

Sub-tasks		Enabling Objectives		Tools & Equipment
		ability to calibrate and adjust controls and pumps		

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.20	Installs overflow piping on pressurized systems.	knowledge of safe working practices knowledge of codes		

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.21	Installs oil filter assembly.	knowledge of safe working practices knowledge of codes		basic hand tools, wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.22	Labels and codes piping.	knowledge of codes and regulations ability to coordinate with other trades knowledge of flow direction ability to read and interpret blueprints		paint and adhesive

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

7.23	Completes required documentation.	knowledge of documentation requirements	

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

BLOCK C SERVICE AND MAINTENANCE OF OIL BURNING AND OIL-COMBINATION BURNING EQUIPMENT AND APPLIANCES

Task 8 Conditions oil burning equipment and appliances annually.

Trend: Trend towards enforcement of routine maintenance schedules. Greater expertise will be required because of design changes and technological advancements.

	Sub-tasks	Enabling Objectives	Tools & Equipment
8.01	Checks previous documentation for maintenance history.	knowledge of computer data bases knowledge of record keeping systems ability to interpret documentation	computer, applicable documents

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.02	Consults with customer to identify problems and history.	ability to communicate effectively	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
8.03	Observes system operation.	knowledge of systems knowledge of manufacturer's specifications knowledge of codes and regulations	tape measure, flashlight, multimeter, testing equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.04	Inspects and cleans heat exchanger surfaces.	knowledge of manufacturer's specifications knowledge of explosive situations ability to disassemble components ability to use cleaning instruments knowledge of metals ability to detect metal deterioration	vacuum cleaner, scraper, brush, trouble light, specialized appliance tools, water hose, screwdriver, wrenches, ballpeen hammer, self-contained breathing apparatus

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.05	Cleans and/or replaces vent pipes or prefab chimney bases.	knowledge of manufacturer's specifications knowledge of explosive situations ability to disassemble components ability to use cleaning instruments knowledge of materials knowledge of side wall venting systems	tin snips, crimping tool, drill, vacuum cleaner, scraper, brush, trouble light, specialized appliance tools, water hose, screwdriver, wrenches, ballpeen hammer, self-contained breathing apparatus

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to detect venting material deterioration	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.06	Cleans and/or replaces air filters.	knowledge of manufacturer's specifications ability to read magnehelic gauge	screwdriver, wrenches, vacuum cleaner, pressure washer, magnehelic gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.07	Replaces nozzle.	knowledge of manufacturer's specifications knowledge of nozzle characteristics ability to choose correct nozzle for proper application	nozzle extractor, box wrenches, socket wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.08	Cleans and/or replaces electrode assembly.	knowledge of manufacturer's specifications ability to perform tests for leaks knowledge of high voltage electricity knowledge of safe working practices	screwdriver, Allen wrenches, high voltage meter, neon test lamp

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
8.09	Cleans and/or replaces burner air gate, housing and fan.	knowledge of manufacturer's specifications	burner brush, compressed air, pressure washer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.10	Cleans and/or replaces flame sensing device.	knowledge of manufacturer's specifications knowledge of proper operation of device knowledge of rectification ability to operate meters	multimeter, flame sensing meter, screwdrivers, wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.11	Cleans and/or replaces exterior of burner and appliance.	knowledge of manufacturer's specifications	cleaning solvent

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.12	Cleans and/or replaces oil filter cartridge.	knowledge of manufacturer's specifications knowledge of environmental regulations knowledge of disposal requirements	wrenches, personal safety equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
8.13	Checks and cleans blower assembly.	knowledge of manufacturer's specifications ability to replace bearings and pulleys	wrenches, hub puller, straight edge, compressed air, pressure washer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.14	Checks and lubricates motors, seals and pumps.	knowledge of manufacturer's specifications ability to read meters knowledge of safe working practices	wrenches, screwdrivers, grease gun, flashlight

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.15	Checks and replaces couplings.	knowledge of manufacturer's specifications ability to identify worn components	Allen wrenches, screwdrivers, hacksaw, penetrating oil

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.16	Checks ignition systems and adjusts to manufacturer's specifications.	knowledge of manufacturer's specifications knowledge of ignition components knowledge of safe working practices ability to use testing equipment	Allen wrenches, multimeter, caliper gauge, calipers, high voltage meter, neon test lamp

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to detect deficiencies in ignition systems	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.17	Tests fuel unit pump pressure and cutoff pressure.	knowledge of manufacturer's specifications knowledge of appliance specifications ability to read gauges	pressure gauge, vacuum gauge, wrenches, screwdrivers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.18	Checks and replaces fuel pump strainer and gasket.	knowledge of safe working practices knowledge of codes	basic hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.19	Checks condition of combustion chamber and repairs or replaces.	knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of safe working practices ability to identify worn components ability to build a combustion chamber knowledge of refractory components	trowel, mitres, hacksaws, personal safety equipment, furnace cement, mirror

Sub-tasks				Enabling Objectives						Tools & Equipment
				ability to apply WHMIS regulations						

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.20	Checks and corrects all oil leaks.	ability to detect oil leaks knowledge of environmental regulations	wrenches, flaring tool, pipe cutter, pipe bender

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.21	Cleans fuel pump and lines.	knowledge of safe working practices knowledge of codes	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.22	Checks exterior of oil tank for corrosion, leaks or blistering.	knowledge of manufacturer's specifications knowledge of environmental regulations knowledge of material components ability to detect leaks ability to identify corrosion ability to identify blistering	trouble light, wire brush, scraper, magnetic patches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.23	Checks interior of oil tank for contaminants.	knowledge of tank composition	oil conditioner, dip stick, hand pump,

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of testing equipment	trouble light, wrenches, water paste
		ability to detect contaminants	
		ability to remove contaminants	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.24	Checks fill pipes, vent pipes, fuel gauges and exposed oil lines for leaks.	knowledge of systems	flashlight, wrenches, flaring tools, cutters, pipe threader, lubricant, vacuum gauge
		knowledge of environmental regulations	
		ability to detect leaks	
		knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.25	Checks safety timing and proper operation of all controls.	knowledge of manufacturer's specifications	combustion analyzer, multimeter, screwdrivers
		ability to use testing equipment	
		knowledge of controls	
		knowledge of codes and regulations	
		knowledge of electrical circuits	
		ability to detect problems	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.26	Operates burner and adjusts fire using	knowledge of manufacturer's specifications	screwdrivers, wrenches, draft gauge, combustion analyzer, multimeter,

	Sub-tasks	Enabling Objectives	Tools & Equipment
	combustion testing equipment.	knowledge of codes and regulations knowledge of burner operation ability to use combustion testing equipment ability to adjust system knowledge of basic combustion knowledge of safe working practices knowledge of sequence of operations and controls	flame signal meter, pressure gauge, pyrometer, smoke tester, vacuum gauge, carbon monoxide tester

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.27	Repairs, adjusts and replaces units and components.	knowledge of heating system components and operational characteristics knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of environmental regulations knowledge of safe working practices ability to repair, adjust and/or replace heating system components

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

8.28	Completes required documentation.	knowledge of documentation requirements

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 9 **Conditions oil-combination burning equipment and appliances annually.**

Trend: Trend towards enforcement of routine maintenance schedules. Greater expertise will be required because of design changes and technological advancements.

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.01	Checks previous documentation for maintenance history.	knowledge of computer data bases knowledge of record keeping systems ability to interpret documentation	computer, applicable documents

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.02	Consults with customer to identify problems and history.	ability to communicate effectively	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.03	Observes system operation.	knowledge of systems knowledge of manufacturer's specifications knowledge of codes and regulations	tape measure, flashlight, multimeter, testing equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.04	Inspects and cleans heat exchanger surfaces.	knowledge of manufacturer's specifications knowledge of explosive situations ability to disassemble components ability to use cleaning instruments knowledge of metals ability to detect metal deterioration	vacuum cleaner, scraper, brush, trouble light, specialized appliance tools, water hose, screwdriver, wrenches, ballpeen hammer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.05	Cleans and/or replaces vent pipes or prefab chimney bases.	knowledge of manufacturer's specifications knowledge of explosive situations ability to disassemble components ability to use cleaning instruments knowledge of materials ability to detect venting material deterioration	tin snips, crimping tool, drill, vacuum cleaner, scraper, brush, trouble light, specialized appliance tools, water hose, screwdriver, wrenches, ballpeen hammer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.06	Cleans and/or replaces air filters.	knowledge of manufacturer's specifications ability to read magnehelic gauge	screwdriver, wrenches, vacuum cleaner, pressure washer, magnehelic gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.07	Replaces nozzle.	knowledge of manufacturer's specifications knowledge of nozzle characteristics ability to choose correct nozzle for proper application	nozzle extractor, box wrenches, socket wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.08	Cleans and/or replaces electrode assembly.	knowledge of manufacturer's specifications ability to perform tests for leaks knowledge of high voltage electricity knowledge of safe working practices	screwdriver, Allen wrenches, high voltage meter, neon test lamp

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.09	Cleans and/or replaces burner air gate, housing and fan.	knowledge of manufacturer's specifications	burner brush, compressed air, pressure washer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.10	Cleans and/or replaces flame sensing device.	knowledge of manufacturer's specifications knowledge of proper operation of device knowledge of rectification	multimeter, flame sensing meter, screwdrivers, wrenches

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to operate meters	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.11	Cleans and/or replaces exterior of burner and appliance.	knowledge of manufacturer's specifications	cleaning solvent

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.12	Cleans and/or replaces oil filter cartridge.	knowledge of manufacturer's specifications knowledge of environmental regulations knowledge of disposal requirements	wrenches, personal safety equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.13	Checks and cleans blower assembly.	knowledge of manufacturer's specifications ability to replace bearings and pulleys	wrenches, hub puller, straight edge, compressed air, pressure washer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.14	Checks and lubricates all motors, seals and pumps.	knowledge of manufacturer's specifications	wrenches, screwdrivers, grease gun, flashlight

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to read meters knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.15	Checks and replaces couplings.	knowledge of manufacturer's specifications ability to identify worn components	Allen wrenches, screwdrivers, hacksaw, penetrating oil

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.16	Checks ignition systems and adjusts to manufacturer's specifications.	knowledge of manufacturer's specifications knowledge of ignition components knowledge of safe working practices ability to use testing equipment ability to detect deficiencies in ignition systems	Allen wrenches, multimeter, caliper gauge, calipers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.17	Tests fuel unit pump pressure and cutoff pressure.	knowledge of manufacturer's specifications knowledge of appliance specifications ability to read gauges	pressure gauge, vacuum gauge, wrenches, screwdrivers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.18	Checks and replaces fuel pump strainer and gasket.	knowledge of safe working practices knowledge of manufacturer's specifications	basic hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.19	Checks condition of combustion chamber and repairs or replaces.	knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of safe working practices ability to identify worn components ability to build a combustion chamber knowledge of refractory components ability to apply WHMIS regulations	trowel, mitres, hacksaws, personal safety equipment, furnace cement, mirror

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.20	Checks and corrects all oil leaks.	ability to detect oil leaks knowledge of environmental regulations	wrenches, flaring tool, pipe cutter, pipe bender

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.21	Cleans fuel pump and lines.	knowledge of safe working practices knowledge of codes	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.22	Checks exterior of oil tank for corrosion, leaks or blistering.	knowledge of manufacturer's specifications knowledge of environmental regulations knowledge of material components ability to detect leaks ability to identify corrosion ability to identify blistering	trouble light, wire brush, scraper, magnetic patches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.23	Checks interior of oil tank for contaminants.	knowledge of tank composition knowledge of testing equipment ability to detect contaminants ability to remove contaminants	oil conditioner, dip stick, hand pump, trouble light, wrenches, water paste

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	no

9.24	Checks fill pipes, vent pipes, fuel gauges and exposed oil lines for leaks.	knowledge of systems knowledge of environmental regulations ability to detect leaks knowledge of codes and regulations	flashlight, wrenches, flaring tools, cutters, pipe threader, lubricant

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.25	Checks safety timing and proper operation of all controls.	knowledge of manufacturer's specifications ability to use testing equipment knowledge of controls knowledge of codes and regulations knowledge of electrical circuits ability to detect problems	combustion analyzer, multimeter, screwdrivers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.26	Operates burner and adjusts fire using combustion testing equipment.	knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of burner operation ability to use combustion testing equipment ability to adjust system knowledge of basic combustion knowledge of safe working practices knowledge of sequence of operations and controls	screwdrivers, wrenches, draft gauge, combustion analyzer, multimeter, flame signal meter, pressure gauge, pyrometer, smoke tester, vacuum gauge, carbon monoxide tester

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.27	Repairs, adjusts and replaces units and components.	knowledge of heating system components and operational characteristics	

Sub-tasks				Enabling Objectives						Tools & Equipment	
				knowledge of codes and regulations							
				knowledge of manufacturer's specifications							
				knowledge of environmental regulations							
				knowledge of safe working practices							
				ability to repair, adjust and/or replace heating system components							

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

9.28	Completes required documentation.	knowledge of documentation requirements	
		knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 10 **Troubleshoots, repairs and replaces burners and components.**

Trend: Increased expertise and knowledge are required; greater understanding of solid state components and circuitry.

Sub-tasks				Enabling Objectives						Tools & Equipment	
10.01	Consults with customer to identify problems and history.			ability to communicate effectively							

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
10.02	Determines possible causes of problems.	knowledge of systems knowledge of sequence of operation ability to interpret problem causes and solutions	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.03	Performs visual inspection of system.	ability to identify all system components knowledge of component functions ability to recognize deficiencies knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.04	Checks power supply.	knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.05	Checks fuel supply.	knowledge of codes and regulations	multimeter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.06	Checks proper operation of controls.	knowledge of manufacturer's specifications knowledge of electrical controls knowledge of electrical circuits	basic hand tools, multimeter

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to read and interpret schematics	
		ability to read meters and testing equipment	
		knowledge of codes and regulations	
		ability to understand proper control operation	
		knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.07	Checks fuel supply at burner.	knowledge of safe working practices	pressure gauge, vacuum gauge, basic hand tools
		knowledge of codes and regulations	
		knowledge of manufacturer's specifications	
		knowledge of burner operation	
		knowledge of sequence of operation	
		knowledge of basic combustion	
		ability to install and read pressure gauge	
		ability to install and read vacuum gauge	
		knowledge of fuel distribution systems	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
10.08	Checks ignition system.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure, high voltage meter, neon test lamp, flame mirror

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.09	Checks fuel nozzle.	knowledge of fuel nozzle operation	basic hand tools, flame mirror

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.10	Checks for flooded combustion chamber.	knowledge of appliance designs knowledge of safe working practices ability to recognize problems and hazards ability to remove fuel	light, fire extinguisher, absorbent material, basic hand tools, mirror

Sub-tasks				Enabling Objectives						Tools & Equipment	
				knowledge of environmental regulations knowledge of codes and regulations							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
10.11	Checks for adequate air supply to support combustion.			knowledge of codes and regulations knowledge of manufacturer's specifications knowledge of air supply allowances for R2000 structures						calculator, tape measure	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
10.12	Checks for blockages in flue passages, combustion chamber and venting system.			knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of safe working practices knowledge of environmental regulations knowledge of side wall venting systems ability to detect blockages or deficiencies in venting systems						light, mirror, manometer, draft gauge	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
10.13	Repairs, adjusts and replaces units and components.	knowledge of manufacturer's specifications knowledge of safe working practices knowledge of codes and regulations knowledge of environmental regulations knowledge of burners and components ability to repair, adjust and/or replace burners and components	basic tools, meters, testers, gauges

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.14	Starts burner.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
10.15	Ensures proper operation of burner by conducting combustion tests.	knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of burner operation ability to use combustion testing equipment ability to adjust systems knowledge of combustion knowledge of safe working practices	screwdrivers, wrenches, draft gauge, combustion analyzer, multimeter, flame signal meter, pressure gauge, pyrometer, smoke tester, vacuum gauge, carbon monoxide tester

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

10.16	Completes required documentation.	knowledge of documentation requirements knowledge of codes and regulations

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 11 **Troubleshoots, repairs and replaces controls.**

Trend: Increased expertise and knowledge are required; greater understanding of solid state components and circuitry.

	Sub-tasks	Enabling Objectives	Tools & Equipment
11.01	Consults with customer to identify problems and history.	ability to communicate effectively	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

11.02	Determines possible causes of problems.	knowledge of systems knowledge of sequence of operation ability to interpret problem causes and solutions	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

11.03	Performs visual inspection of system.	ability to identify all system components knowledge of component functions ability to recognize deficiencies knowledge of codes and regulations	light, mirror, multimeter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

11.04	Checks power supply.	knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

11.05	Checks for proper operation of each control.	knowledge of manufacturer's specifications	multimeter, basic hand tools

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of electrical controls	
		knowledge of electrical circuits	
		ability to read and interpret schematics	
		ability to read meters and testing equipment	
		knowledge of codes and regulations	
		ability to understand proper control operation	
		knowledge of safe working practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

11.06	Repairs, adjusts, calibrates and replaces control.	knowledge of manufacturer's specifications	basic hand tools, multimeter, pyrometer
		knowledge of safe working practices	
		knowledge of codes and regulations	
		knowledge of environmental regulations	
		knowledge of controls and components	
		ability to repair, adjust and/or replace controls and components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

11.07	Starts system.	knowledge of safe working practices	basic hand tools, combustion analysis kit, flame signal meter,

Sub-tasks					Enabling Objectives				Tools & Equipment			
					knowledge of manufacturer's specifications				multimeter, steel ruler, tape measure			
					knowledge of codes and regulations							
					knowledge of basic combustion							
					knowledge of burner operation							
					knowledge of flame safeguard testing							
					knowledge of sequence of operation and controls							
					ability to bleed fuel pump							
					ability to check and adjust burner controls and components							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes	
11.08	Ensures proper operation of controls.				knowledge of manufacturer's specifications				combustion analyzer, multimeter, screwdrivers, basic hand tools			
					ability to use testing equipment							
					knowledge of controls							
					knowledge of codes and regulations							
					knowledge of electrical circuits							
					ability to detect problems							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes	
11.09	Completes required documentation.				knowledge of documentation requirements							

Sub-tasks	Enabling Objectives	Tools & Equipment

knowledge of codes and regulations

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 12 **Troubleshoots, repairs and replaces warm-air appliances.**

Trend: Increased expertise and knowledge are required; greater understanding of solid state components and circuitry.

Sub-tasks	Enabling Objectives	Tools & Equipment

12.01 Consults with customer to identify problems and history.

ability to communicate effectively

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.02 Determines possible causes of problems.

knowledge of systems

knowledge of sequence of operation

ability to interpret problem causes and solutions

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.03 Performs visual inspection of system.

ability to identify all system components

knowledge of component functions

ability to recognize deficiencies

Sub-tasks		Enabling Objectives	Tools & Equipment
		knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.04	Checks heat exchanger for integrity.	knowledge of manufacturer's specifications knowledge of safe working practices knowledge of proper testing procedures ability to perform tests ability to interpret test results ability to test for deficiencies	flashlight, smoke bomb, carbon monoxide tester, non-destructive tester, tester, leak detection device

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.05	Checks venting system for leaks or blockages.	knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of safe working practices knowledge of environmental regulations knowledge of side wall venting systems ability to detect blockages or deficiencies in venting systems	light, mirror, manometer, draft gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
12.06	Checks combustion chamber for integrity.	knowledge of appliance designs knowledge of safe working practices ability to recognize problems and hazards knowledge of environmental regulations knowledge of codes and regulations	flashlight

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.07	Checks blower assembly and filters.	knowledge of safe working practices knowledge of codes and regulations knowledge of manufacturer's specifications ability to adjust pulleys and belts knowledge of static pressures	straight edge, tachometer, manometer, velometer, magnehelic gauge

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.08	Checks air distribution system for blockages.	knowledge of system designs ability to use testing devices ability to interpret test results	velometer, magnehelic gauge, screwdrivers, mirror, straight edge, tachometer, manometer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
12.09	Repairs, adjusts and replaces units and components.	knowledge of manufacturer's specifications knowledge of safe working practices knowledge of codes and regulations knowledge of environmental regulations knowledge of warm-air appliances and components ability to repair, adjust and/or replace warm-air appliances and components	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.10	Starts system.	knowledge of safe working practices knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of basic combustion knowledge of burner operation knowledge of flame safeguard testing knowledge of sequence of operation and controls ability to bleed fuel pump ability to check and adjust burner controls and components	basic hand tools, combustion analysis kit, flame signal meter, multimeter, steel ruler, tape measure

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
12.11	Ensures proper operation of burner by conducting combustion tests.	knowledge of manufacturer's specifications knowledge of codes and regulations knowledge of burner operation ability to use combustion testing equipment ability to adjust system knowledge of combustion knowledge of safe working practices knowledge of sequence of operations and controls	screwdrivers, wrenches, draft gauge, combustion analyzer, multimeter, flame signal meter, pressure gauge, pyrometer, smoke tester, vacuum gauge, carbon monoxide tester

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.12	Checks power humidifiers and electrostatic air cleaners.	knowledge of operation	sling psychrometer, hygrometer, multimeter

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

12.13	Completes required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 13 **Troubleshoots, repairs and replaces liquid medium appliances.**

Trend: Increased expertise and knowledge are required; greater understanding of solid state components and circuitry.

	Sub-tasks	Enabling Objectives	Tools & Equipment
13.01	Consults with customer to identify problems and history.	ability to communicate effectively	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.02	Determines possible causes of problems.	knowledge of systems knowledge of sequence of operation ability to interpret problem causes and solutions	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.03	Performs visual inspection of system.	ability to identify all system components knowledge of component functions ability to recognize deficiencies knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.04	Checks heat exchanger for integrity.	knowledge of manufacturer's specifications knowledge of safe working practices	flashlight, smoke bomb, carbon monoxide tester, non-destructive tester, leak detection device

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of proper testing procedures	
		ability to perform tests	
		ability to interpret test results	
		ability to test for deficiencies	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.05	Checks venting system for leaks or blockages.	knowledge of manufacturer's specifications	flashlight, mirror, manometer, draft gauge
		knowledge of codes and regulations	
		knowledge of safe working practices	
		knowledge of environmental regulations	
		knowledge of side wall venting system	
		ability to detect blockages or deficiencies in venting systems	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.06	Checks combustion chamber for integrity.	knowledge of appliance designs	light, mirror
		knowledge of safe working practices	
		ability to recognize problems and hazards	
		knowledge of environmental regulations	

Sub-tasks				Enabling Objectives						Tools & Equipment	
				knowledge of codes and regulations							
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
13.07	Checks circulating pumps and pump components for proper operation.			knowledge of manufacturer's specifications knowledge of system designs ability to interpret flow rates ability to interpret temperature differentials						multimeter, pyrometer, screwdrivers, Allen wrenches, pressure gauge, vacuum gauge	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
13.08	Checks system temperature and pressure.			knowledge of design specifications knowledge of codes and regulations ability to interpret tests ability to perform tests						pressure gauge, temperature gauge	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes
13.09	Checks expansion tank and air purgers.			knowledge of thermodynamics knowledge of codes and regulations knowledge of system designs knowledge of equipment						screwdrivers, wrenches, pressure gauge	
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
13.10	Checks distribution system for proper operation.	knowledge of system designs ability to use testing devices ability to interpret test results	velometer, magnehelic gauge, screwdrivers, mirror, straight edge, tachometer, manometer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.11	Repairs, adjusts and replaces units and components.	knowledge of manufacturer's specifications knowledge of safe working practices knowledge of codes and regulations knowledge of environmental regulations knowledge of liquid medium appliances and components ability to repair, adjust and/or replace liquid medium appliances and components	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.12	Verifies concentration and adds freeze protection agent.	knowledge of WHMIS knowledge of local temperature extremes	basic hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.13	Starts appliance.	knowledge of safe working practices	basic hand tools, combustion analysis kit,

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of manufacturer's specifications	flame signal meter, multimeter, steel ruler, tape measure
	knowledge of codes and regulations	
	knowledge of basic combustion	
	knowledge of burner operation	
	knowledge of flame safeguard testing	
	knowledge of sequence of operation and controls	
	ability to bleed fuel pump	
	ability to check and adjust burner controls and components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

13.14	Ensures proper operation of appliance by performing combustion tests.	knowledge of safe working practices	basic hand tools, multimeter, pyrometer
		knowledge of manufacturer's specifications	
		knowledge of codes and regulations	
		knowledge of complete heating system	
		knowledge of sequence of operation and controls	
		knowledge of control limits	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
13.15	Completes required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

BLOCK D RETROFIT OF EXISTING EQUIPMENT

Task 14 Evaluates existing system and plans new system.

Trend: The most significant trend here is the concept of energy management planning. This impacts on new system designs. Also, new technologies (e.g. radiant heating) will be more prevalent.

	Sub-tasks	Enabling Objectives	Tools & Equipment
14.01	Performs visual inspection of system.	ability to identify all system components knowledge of component functions ability to recognize deficiencies knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

14.02	Verifies appliance or equipment to be retrofitted	knowledge of firebox condition	

	for safe connection using the present firebox or refractory material relining.	ability to line firebox	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

14.03	Analyzes system.	ability to identify all system components knowledge of component functions ability to recognize deficiencies knowledge of codes and regulations ability to perform appropriate tests	combustion analyzer, multimeter, pressure gauge, temperature gauge, screwdrivers, combination wrenches, calculator, carbon monoxide tester

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

14.04	Evaluates customer's expectations.	ability to communicate effectively ability to interpret information	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

14.05	Determines scope of work to be performed and costs involved.	knowledge of product availability knowledge of product costs knowledge of component compatibilities	technical information

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
14.06	Presents proposal to customer for approval.	ability to communicate effectively ability to formulate a professional proposal	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

14.07	Completes required documentation.	knowledge of documentation requirements knowledge of codes and regulations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

14.08	Submits plans to necessary agencies for approval.	knowledge of codes and regulations knowledge of roles and responsibilities of enforcing authorities	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	no	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 15 Removes existing equipment.

Trend: The increasing emphasis on environmental concerns will impact on the transporting and disposal of removed equipment.

	Sub-tasks	Enabling Objectives	Tools & Equipment
15.01	Coordinates removal activities with customer.	ability to communicate effectively	

Sub-tasks	Enabling Objectives	Tools & Equipment
	ability to develop work schedules	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

15.02	Disconnects services.	knowledge of safe working practices knowledge of environmental regulations ability to coordinate with other trades ability to safely disconnect electrical service ability to safely disconnect plumbing service ability to safely disconnect fuel service ability to safely disconnect venting service ability to safely disconnect air distribution system	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

15.03	Isolates work area.	knowledge of safe working practices knowledge of hazardous materials, such as asbestos ability to coordinate with other trades	safety tape, safety signs, drop sheets, hoarding, polyethylene sheet, flame retardant

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	no	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

	Sub-tasks	Enabling Objectives	Tools & Equipment
15.04	Disassembles and removes existing equipment.	knowledge of safe working practices knowledge of safe rigging practices ability to coordinate with other trades ability to safely use power and hand tools	cutoff saw, saws all, hammer drill, chipping hammer, power nibbler

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

15.05	Coordinates proper disposal of equipment.	knowledge of environmental regulations knowledge of codes and regulations ability to coordinate with other trades	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

15.06	Cleans up site.	knowledge of environmental regulations knowledge of safe working practices	vacuum cleaner, scraper, brush, mop, broom

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

Task 16 **Installs retrofit system.**

Trend: Equipment will tend to be of greater fuel efficiency and greater performance. Burners are more complex and greater knowledge and expertise are required for set-up. Flow requirements to the appliance are much more critical. Installers must be more cognizant of advances in technology.

	Sub-tasks	Enabling Objectives	Tools & Equipment
16.01	Prepares site for retrofitting.	knowledge of codes and regulations knowledge of manufacturer's specifications on new installations	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

16.02	Installs appliances and/or equipment.	ability to perform installation procedures	screwdrivers, pipe wrench, socket wrench, torque wrench, combination wrench, Allen wrench, caulking gun, tin snips, flaring tool, electric drill, trouble light, wire brush, wire stripper, hammer, alignment bars, pry bar, level, chain fall, come-along, A-frames, scaffolding, ladder

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
yes	yes	yes	yes	ND	ND	ND	ND	ND	ND	NV	yes

APPENDICES

TOOLS AND EQUIPMENT

adjustable wrenches
alignment bars
Allen wrenches
air velocity meter
ammeters
amp probe
aviation snip
ballpeen hammer
bos spanner
burner brush
calculator
calliper gauge
callipers
caulking gun
chain falls
chipping hammer
CO analyzer
CO_2 testing equipment
combination wrenches
come-alongs
compressed air
concrete cutting tool
control component tester
copper tube cutter
crane
crimper
cutoff saw
draft gauge
draft testing equipment
drafting tool
duckbill pliers
dye penetrant
flame mirror
flame signal meter
flaring tool
flashlight
flowmeter
grease gun
hacksaw
hammer drill
hoist
hydrostatic pump
hygrometer
ladder
level
linesman
magnehelic
magnetic gauge
magnetic patches
manometer
masonry cutting tool
measuring rule
measuring tape
megohmmeter
metal cutting tool
mitre
multimeter
neon test lamp
nozzle wrenches
O_2 testing equipment
ohmmeter
oil filter wrenches
open end wrenches
percussion hammer
pipe threaders
pipe wrenches
plumb-bob
porcelain cutter
power drill
power grinder
power nibbler
power saw
power vices with threading attachments
pressure gauges
pressure washer
pry bars
pullers
pyrometer
reamers
remote bulb
rigging equipment
scaffolding

scraper
side cutters
sling psychrometer
smoke testing equipment
socket wrenches
soldering torch
squares
steel pipe cutters
steel pipe reamers
tachometer
tap and die sets
temperature testing equipment
thermocouples
torches
torque wrenches
transit level
trouble light
trowels
tube benders
tube reamers
tuggers
ultrasound
vacuum cleaners
vacuum gauges
velocity meters
velometer
voltmeters
wire strippers
wood cutting tools
x-ray

Protective clothing and devices

back boards
dust masks
ear plugs
face shields
fire blankets
fire extinguishers
fire resistant clothing
first aid kit
flame retardant
gas detection devices
gloves
hard hats
respirator
safety boots
safety glasses
safety harness
safety signs
safety tape
self-contained breathing apparatus
stretchers
ventilation equipment
welding helmets

GLOSSARY

air supply — the air for combustion, ventilation and flue-gas dilution (with respect to the installation of an appliance).

air temperature rise — the difference in temperature between the average temperature of the air discharged from the air-outlet opening (i.e., the outlet-air temperature measured in the largest plenum take-off downstream of the connection to the plenum, only to a point such that the radiated heat from the heat exchanger will not directly strike the temperature sensor) and the average temperature of the air entering the air-inlet opening (i.e., the inlet-air temperature measured in the return air plenum downstream from all branch connections).

antiflooding device — a primary safety control which causes the fuel to be shut off upon a rise of fuel above the normal level, or upon receiving excess fuel.

appliance — a device to convert fuel into energy, and including all components, controls, wiring, and piping required as part of the device by the applicable standard.

appliance control system — a combination, as applicable, of a primary safety control, limit controls, and/or operating controls that are used to control the burner of an appliance. The system may be **automatic** (where the burner, when started, will continue for an unlimited number of operating cycles without manual attention unless shut down by the combustion safety control), **semi-automatic** (where the burner, when started, will continue for an unlimited number of operating cycles without manual attention unless shut down by the combustion safety control or limit control, or **manual** (where the burner, when started, will complete only one cycle of operation without manual attention).

appliance supply piping — the fuel supply piping leading to the burner of an appliance from a supply tank or, in the case of a central oil distribution system, from the sub-atmospheric or demand valve immediately downstream of the meter.

approved — acceptable to the regulatory authority.

atmospheric tank — a tank which is open to atmosphere and not subject to static oil pressure at the bottom in excess of a gauge pressure of 70 kPa (10 psi) when the fill or vent pipe is full of oil.

atomizing-type oil burner — an oil burner which breaks up the fuel into liquid fuel droplets prior to vaporization. (Refer to oil burner.)

attic furnace — a horizontal furnace intended for installation in attics or other unoccupied spaces with low head room. (Refer to furnace.)

automatically operated damper — a damper operated by an automatic control. (Refer to damper.)

automatic burner — a burner equipped with an automatic appliance control system. (Refer to burner.)

automatic input control valve — a valve for modulating the fuel supply to the main burner without requiring manual action. (Refer to valve.)

automatic valve — a valve designed to turn on or shut off the fuel flow to the burner without requiring manual action. (Refer to valve.)

automatic valve of the manual reset type — an automatic valve that will remain closed until manually reopened. (Refer to valve.)

auxiliary tank — a supply tank which is installed in the fuel supply between a burner and its main fuel supply tank. (Refer to supply tank.)

baffle (fixed damper) — a stationary device used to divert the flow of fluid (air, water or steam), or flue gases (flue baffle), or to shield parts of an appliance from the effects of flame (flame baffle), or heat (heat baffle).

barometric tank — a supply tank which automatically maintains, by barometric pressure, a definite level of oil in a sump. (Refer to supply tank.)

blower assembly — the complete blower assembly, including the blower wheel (or fan), the blower housing, the motor and drive, used to provide the means for the circulation of air in a forced-air furnace.

blower control (fan control) — the temperature-actuated switch controlling only the on-off operation of an air-circulating blower.

boiler — an appliance intended to supply hot water or steam for space heating, processing or power purposes.

bonnet	the part of a furnace casing which forms the supply plenum, or to which the supply plenum is attached.
Btu	a British thermal unit, being the quantity of heat required to raise 1 lb. of water through 1 °F.
Btu/h	a Btu per hour.
building	any structure used or intended for sheltering persons, animals, or property, and which is classified by its major occupancy according to the classifications of the *National Building Code of Canada*.
burner	a device or group of devices forming an integral unit for the introduction of fuel, with or without air or oxygen, into the combustion zone for ignition.
burner unit	one or more burners which can be ignited safely from one source of ignition.
carbon monoxide test	a part of the combustion analysis test that measures the level of carbon dioxide in flue gas.
central furnace	a furnace utilizing ducts and intended for heating rooms or spaces separate from the room in which the furnace is located. (Refer to furnace.)
central oil distribution system	a system by which oil is supplied through piping from a central supply tank or tanks to buildings, mobile homes, travel trailers, or other structures.
certified	(with respect to appliances, components and accessories) investigated and suitably marked by a nationally recognized certification agency acceptable to the authority having jurisdiction as conforming to recognized standards or requirements.
chimney	a primarily vertical shaft enclosing at least one vent for conducting flue gases to the outside atmosphere.
chimney draft	the available natural draft of the chimney, measured at or near the base of the chimney. (Refer to draft.)
chimney thimble	the connector that joins the vent connector through the wall to the chimney and liner.

circulating air	the heating medium that is moved through the furnace from the air-inlet opening to the air-outlet opening.
combustion air	the air required for satisfactory combustion of fuel, including excess air.
combustion analysis	a series of tests measuring the properties of flue gases to determine the level of combustion.
combustion chamber	a metal or refractory chamber located within the firebox of an appliance, and used to contain the combustion flame.
combustion safety control	a primary safety control (flame safeguard) sensing the presence of flame and causing fuel to be shut off in the event of flame failure or ignition failure.
combustion zone	the zone where combustion is intended to occur.
commercial-type appliance	an appliance other than a residential-type appliance. (Refer to appliance.)
commercial-type equipment	equipment other than residential-type equipment.
component	an essential part of an appliance that may be certified separately from the appliance.
condensate (condensation)	the liquid that separates from gas or from combustion products because of a reduction in temperature.
connector	a tube or hose with a fitting at each end, for connecting combinations of appliances, fuel containers and piping.
constant-level valve	a device for maintaining, within a reservoir, a constant level of fuel for delivery to the burner.
construction heater	a portable appliance intended for temporary space heating during construction.
container	a reusable vessel that has a capacity of 225 L (50 gal.) or less, but excluding any vessel which is an integral part of or permanently attached to any appliance, equipment or vehicle.
continuous pilot	a pilot that burns without turndown throughout the entire time the burner is in service, whether or not the main burner is firing. (Refer to pilot.)

cooking appliance — an appliance intended for supplying heat for cooking purposes. (Refer to appliance.)

counter-flow furnace — a furnace through which the circulating air flows in the opposite direction to the flue gases. (Refer to furnace.)

damper — a movable plate or valve for regulating the flow of air or flue gas.

dilution air — air added to the flue gases after the heat exchanged in the appliance. This air is often introduced at the draft regulator (barometric damper), usually to isolate the appliance from the effects of the wind on the chimney top.

direct-fired appliance — an appliance in which the combustion products or flue gases are intermixed with the medium being heated.

direct service water heater — a service water heater which derives its heat directly from either an electrical resistance element of the combustion of fuel. (Refer to service water heater.)

direct space-heating furnace — a furnace intended for heating the space in which the furnace is located. (Refer to furnace.)

down-flow furnace — a furnace in which the circulating air flows downward, discharging at or near the bottom of the casing. (Refer to furnace.)

draft — the pressure difference which is available to drive the flow of air or combustion gases or both through an appliance and its venting system.

draft regulator — a draft control device intended to stabilize the natural draft in an appliance by admitting room air to the venting system.

draft test — a part of the combustion analysis test that measures pressure differentials between the venting system and outside air, using an approved device.

drop pipe — the vertical pipe that conducts fuel down to an appliance.

duct furnace — a furnace intended for installation in the air distribution ducts, the air circulated by means of a blower which is not an integral part of the furnace. (Refer to furnace.)

equivalent length — the resistance of vent or vent connector fittings (elbows, reducers, etc.) to flue gas flow, expressed in terms of linear length of straight vent pipe.

excess air — air supplied to the combustion zone in excess of that which is theoretically required for complete combustion.

expanding pilot — a pilot that normally burns at a low turndown throughout the entire time the burner is in service whether or not the main burner is firing, except that upon a call for heat the pilot automatically expands so as to reliably ignite the main burner. (Note: This pilot may be turned down at the end of the flame-establishing period for the main burner.) (Refer to pilot.)

factory-built chimney — a chimney consisting entirely of factory-made parts, each designed to be assembled without requiring field fabrication. (Refer to chimney.)

fast closing valve — a valve that has a maximum closing time of 5 s upon being de-energized. (Refer to valve.)

firebox — a metal enclosure in which fuel or gaseous derivatives of fuel are burned, and forming a portion of the heat exchanger.

fire resistance rating — the rating (hours) assigned by a nationally recognized authority to a material or assembly of materials in accordance with standard fire test methods.

firing rate (flow rate) — the fuel input rate to a burner.

flame — a quantity of burning gas or vapour, not necessarily visible.

flame-establishing period — the length of time fuel is permitted to be delivered before the flame-sensing device is required to detect flame.

flame failure reaction time — the interval between flame extinguishment and the de-energizing of the devices that are used for stopping or reducing the fuel supply to the burner.

flame-sensing device — that component of a combustion safety control that senses flame.

flash-point — the lowest temperature of a liquid fuel at which application of the test flame, under specified test conditions, causes the vapours above the surface of the liquid to ignite but not continue to burn.

flexible connector — a connector made of flexible tubing.

flexible tubing — tubing that can be easily bent without the use of special tools, does not necessarily retain its bend, and is not subject to damage if rebent several times. (Refer to tubing.)

flue damper	a damper located in a vent. (Refer to damper.)
flue gases	combustion products and excess air.
flue-gas loss	the heat loss escaping in the flue gases.
forced-air furnace	a furnace equipped with a blower which provides the primary means for circulation of air. (Refer to furnace.)
forced draft	mechanical draft created by a device upstream from the combustion zone of an appliance. (Refer to draft.)
fuel oil	kerosene or any hydrocarbon oil as classified in CSA Standard B140.0, *General Requirements for Oil Burning Equipment.*
fuel oil type	the classification number for a particular fuel oil, as specified in CSA Standard B140.0.
furnace	a space-heating appliance, using warm air as the heating medium, and usually having provision for the attachment of ducts.
gallon	except where specifically indicated otherwise, the Canadian standard gallon as defined under the *Canadian Weights and Measures Act of 1951*, as amended July 8, 1959.
gravity furnace	a furnace in which the circulation of air is primarily by convection. (Refer to furnace.)
gravity tank	a supply tank from which the oil is delivered to the burner by gravity. (Refer to supply tank.)
hazard	the creation of an unsafe condition, including excess temperature of local air or materials, or introduction of quantities of combustion products that could affect the health of safety of occupants.
heating surface	the fireside of the walls of the heat exchanger exposed to the flue gases.
heat exchanger	the firebox and any auxiliary heat transfer surfaces within the casing of an appliance.
heat reclaimer	a device intended to be installed in the vent pipe between an appliance and the chimney to transfer heat from the flue gases through metal to air or water.

heat transfer surface — the surface of a heat exchanger designed to transfer heat between two physically separated fluids.

high pressure boiler — a boiler other than a low pressure boiler. (Refer to boiler.)

horizontal furnace — a furnace in which the circulating air flows horizontally with the air inlet and discharge openings at opposite ends of the casing.

hose — flexible tubing that does not consist of a single continuous metal wall.

hose connector — a connector made of hose.

ignition — establishment of a flame.

in-line furnace — a furnace in which the air inlet and discharge openings are situated in the top of the casing. (Refer to furnace.)

incinerator — an appliance in which combustible wastes are ignited and burned.

indirect fired appliance — an appliance in which the combustion products or flue gases are not mixed within the appliance with the air being heated.

indirect service water heater — a service water heater which derives its heat from a heating medium such as warm air, steam or hot water. (Refer to service water heater.)

induced draft — mechanical draft created by a device downstream from the combustion zone of an appliance. (Refer to draft.)

instantaneous (tankless)-type service water heater — a service water heater designed to supply hot water directly to the outlets without storage facilities. (Refer to service water heater.)

integral tank — a supply tank which is a component part of the appliance and is mounted thereon. (Refer to supply tank.)

intermittent ignition — electric ignition that continues to function throughout the entire period that the flame is present.

intermittent pilot — an electric-ignited pilot which is automatically lighted whenever there is a call for heat, and which burns throughout the entire period that the main burner is firing. (Refer to pilot.)

interrupted ignition — electric ignition that ceases to function after the flame-establishing period.

interrupted pilot	an electric-ignited pilot which is automatically lighted each time there is a call for heat, and in which the pilot fuel is cut off automatically at the end of the flame-establishing period of the main burner. (Refer to pilot.)
laundry stove	an appliance consisting of one or more open-top burners mounted on high legs or having a cabinet base.
limit control	a safety control intended to prevent unsafe conditions of temperature, pressure or liquid level.
low pressure boiler	a boiler in which gas or vapour is generated, and which is intended to be operated or is operated at a gas of vapour pressure of not more than 103 kPa (15 psi); or a boiler in which a liquid is heated by no gas or vapour is generated, and which is intended to be operated or is operated at a liquid pressure of not more than 1103 kPa (160 psi), and in which the temperature of the liquid at the outlet does not exceed 121°C (250°F).
main burner	the burner unit exclusive of the pilot burner. (Refer to burner.)
manometer	device used to measure positive and negative pressures.
manual appliance	an appliance equipped with a manual burner. (Refer to appliance.)
manual burner	a burner equipped with a manual appliance control system. (Refer to burner.)
manually operated damper	an adjustable damper manually set and locked in the desired position.
masonry/concrete chimney	a field-constructed chimney of brick, stone, concrete, or masonry units. (Refer to chimney.)
maximum allowable working pressure	the pressure at which a boiler is permitted to be operated or used under applicable pressure vessel acts.
mechanical draft	draft created by a mechanical device such as a fan, blower, or aspirator that may supplement natural draft. (Refer to draft.)
metal chimney (smokestack)	a field-constructed single-walled chimney of ferrous metal.
modulating	the infinite variance of the volume of the flow of fuel or air, or both, between predetermined minimum and maximum limits.

natural draft — draft produced by the difference in density of the gases in the vertical portions of vents and the density of the surrounding air, or by wind effects at the chimney top. The density differences in combustion appliances are essentially due to the higher temperatures of the flue gases, when compared with that of the surrounding air. (Refer to draft.)

natural draft burner — a burner which is not equipped with a mechanical device for supplying combustion air. (Refer to burner.)

negative pressure — a condition where the pressure at a specified point in the system is less than the pressure of the air at the same elevation, outside the appliance or venting system. Also referred to as induced or natural draft.

oil burner — a device for burning oil.

oil burner assembly — an assembly comprising an oil burner and such devices as may be required to control the supply of fuel and air to the burner.

oil burning equipment — one or more oil burning appliances together with their fuel tanks, fuel piping, wiring, controls, and accessories.

oil distribution main — a pipe intended to convey fuel oil from a central supply tank or tanks to oil service pipes.

oil service pipe — a pipe intended to convey fuel oil from an oil distribution main to the appliance supply piping.

operating control — a control used to regulate or control the normal operation of the equipment.

over-fire pressure/draft — the pressure difference between the pressure in the combustion chamber directly over the fire and the pressure of the surrounding air, the latter being used as the datum.

package unit — an appliance supplied by one manufacturer as a complete unit, including burner, controls and integral wiring.

pilot — a flame which is utilized to ignite the fuel at the main burner or burners.

pilot burner — a burner at which the pilot is established. (Refer to burner.)

pilot valve — a valve to control the supply of fuel to a pilot burner. (Refer to valve.)

pipe fitting — an item in a piping system that is used as a connector, such as an elbow, return bend, tee, union, bushing, coupling, cross, or nipple, but not including such functioning items as valves or regulators.

piping — the fuel conduits of circular cross section that are of sufficient wall thickness and or suitable outside diameter for threading to Iron Pipe Size (IPS) Standards, and that are specified by nominal inside diameter (ID).

piping outlet — the termination of fuel piping near or at the location of an appliance or proposed appliance.

piping riser — the vertical pipe that conducts fuel upward.

plenum — a chamber for distributing warm air from a furnace to the supply ducts (supply plenum), or for receiving air to be heated by the furnace (return plenum).

POL — the petrol oil and lubricant standard to which valves and other accessories are designed and constructed.

portable equipment/appliance — equipment/appliance that is readily moved from place to place; such equipment may be vent-connected.

power burner — a burner in which the combustion air is supplied by a fan or blower at sufficient pressure to overcome the resistance of the burner and the appliance. (Refer to burner.)

pressure relief valve — a valve that opens automatically to relieve a pressure in excess of a predetermined setting, and closes after such relief. (Refer to valve.)

primary air — that portion of the combustion air that is supplied for the initial stages of the combustion process, and that is supplied upstream from the point of ignition. (Refer to combustion air.)

primary heating surface — the surfaces of those portions of the heat exchanger exposed to direct radiation from the fire or combustion chamber, and including that portion which encloses the combustion chamber.

primary safety control — the automatic safety control intended to prevent abnormal discharge of fuel at the burner in the event of ignition or flame failure.

process application — the application of heat for other than space heating or service water heating.

proved pilot — a pilot flame supervised by a primary safety control, which senses the presence of the pilot flame prior to permitting the main burner fuel to be delivered for combustion. (Refer to pilot.)

purge — to replace the existing fluid, gaseous or liquid, in the fuel piping or the appliance with the desired fluid.

radiator — a metal enclosure located within the furnace casing, consisting of secondary heating surfaces, and forming a portion of the heat exchanger.

range — a cooking appliance equipped with a cooking surface and one or more ovens.

readily accessible — capable of being reached quickly for operation, renewal, servicing or inspection without requiring the climbing over or removal of obstacles or the use of portable ladders.

repair garage — a building, or part thereof, where facilities are provided for the repair and servicing of motor vehicles.

residential garage — a building, or part thereof, used or intended for the storage of not more than four passenger motor vehicles, and intended to serve an individual dwelling.

residential-type appliance — an appliance commonly used in, but not restricted to, one- or two-family dwellings. (Refer to appliance.)

residential-type equipment — equipment commonly used in, but not restricted to, one- or two-family dwellings.

reversible-flue furnace — a furnace in which the upward direction of flow of the flue gas is reversed before reaching the flue collar. (Refer to furnace.)

rigid tubing — tubing that normally cannot be bent without the use of special tools. (Refer to tubing.)

safety circuit — a circuit used in a safety control system.

safety combustion unit — an appliance where all the air required for combustion is taken directly from outdoors and the flue gases are exhausted directly outdoors.

safety control — an automatic control of a safety control system.

safety control system — a system of automatic controls that is intended to automatically prevent unsafe operation of the controlled equipment, and may include relays, switches and other auxiliary equipment and interconnecting circuitry.

safety shut-off valve — a valve that automatically shuts off the supply of fuel in response to the action of a combustion safety control or limit control. (Refer to valve.)

secondary air — that portion of the combustion air that is supplied for the intermediate and final stages of the combustion process, and that is externally supplied downstream from the point of ignition. (Refer to combustion air.)

secondary heating surface — the surfaces of those portions of the heat exchanger conveying the combustion products or flue gases from the enclosure forming the primary heating surfaces to the vent outlet.

self-energized control system — a burner control system where part of the heat energy of the pilot is converted through a thermopile to electrical energy, sufficient to operate the control system and automatic valves.

self-energized pilot — the pilot used in a self-energized control system. (Refer to pilot.)

self-energized valve — the valve used in a self-energized control system. (Refer to valve.)

self-generating millivolt circuit — a circuit in which an electromotive force is generated by the effect of the heat of a flame upon a thermopile element.

semi-automatic appliance — an appliance equipped with a semi-automatic burner. (Refer to appliance.)

semi-automatic burner — a burner equipped with a semi-automatic appliance control system. (Refer to burner.)

semi-rigid connector — a connector made of semi-rigid tubing.

semi-rigid tubing — tubing that normally can be bent without the use of special tools, retains its bend, and is subject to appreciable damage if rebent several times. (Refer to tubing.)

service compartment — a normally enclosed compartment of an assembly which is accessible for occasional operations such as "lighting-up" or the adjustment, cleaning or servicing of such parts of the equipment as air-filters, blowers, motors, controls, etc.

service water heater	an appliance intended for the heating of water for plumbing services (as distinct from water for space heating).
shut-off valve	a manual valve used in the piping to fully turn on or fully shut off the fuel supply to any section of a piping system or to an appliance. (Refer to valve.)
smoke test	a part of the combustion analysis test that measures the density of carbon contained in flue gas.
space-heating appliance	an appliance intended for the supplying of heat directly to a room of space (e.g. space heater, fireplace, unit heater) or to rooms or spaces of a building through a heat distributing system (e.g. central furnace, boiler). (Refer to appliance.)
stack temperature test	a part of the combustion analysis test that measures the temperature of the flue gases.
storage garage	a building, or part thereof, used or intended for the storage or parking of motor vehicles and which contains no provision for the repair or servicing of such vehicles.
storage tank	a tank for the storage of fuel and from which the fuel-burning equipment is not intended to be fed automatically.
storage-type service water heater	a service water heater with an integral hot water storage tank. (Refer to service water heater.)
space/room heater	a space-heating appliance for heating the room or space within which it is located, without the use of ducts.
stove	an appliance intended for cooking and space heating.
supply tank	a tank for the storage of fuel and from which the fuel-burning equipment is intended to be fed automatically.
suspended furnace	a horizontal furnace with provision for suspension. (Refer to furnace.)
temperature (total)	the actual measured temperature, including the room ambient temperature.

temperature relief valve	(a) fusible plug-type - a device that opens, and keeps open, a relief opening by the melting or softening of a fusible plug or cartridge at a predetermined temperature; (b) reseating or self-closing-type - a valve that opens automatically when a predetermined temperature is exceeded and closes automatically when the temperature falls below a predetermined lower value. (Refer to valve.)
thimble	the masonry or metal sleeve mortared into the side of a chimney for the purpose of receiving a vent connector.
tubing	fuel conduits of circular cross section that are not of sufficient wall thickness or of suitable outside diameter to permit threading to Iron Pipe Size (IPS) Standards, and are specified by outside diameter (OD).
unit heater	a suspended space heater with an integral air circulating fan, that is intended for the heating of the nonresidential space in which it is installed.
unvented appliance	an appliance not intended to be connected to a venting system.
up-flow furnace	a furnace in which the circulating air flows upward, discharging at or near the top of the casing. (Refer to furnace.)
valve	a device by which the flow of a fluid may be started, stopped or regulated by a movable part which opens or obstructs passage.
vaporizing-type oil burner	an oil burner in which oil is vaporized from a film on a surface of the burner. (Refer to oil burner.)
vent	an enclosed passageway for conveying flue gases.
vent collar	the portion of a fuel-fired appliance designed for the attachment of the vent connector or breeching.
vent connector	the conduit connecting the vent collar of an appliance to a chimney or through-the-wall vent system.
vented appliance	an appliance intended to be connected to a venting system.
vent gases	flue gases plus dilution air.
venting	the removal of flue gases or vent gases to the outside air by means of building openings or venting systems.

venting system — a system for the removal of flue gases or vent gases to the outside air by means of vent connectors, chimneys, gas vents or exhaust systems, natural or mechanical.

vent outlet — the opening of a fuel-fired appliance through which the flue gases pass to the vent connector or breeching.

vent-outlet pressure/draft — the pressure difference between the pressure at the vent outlet of the appliance and the pressure of the surrounding air, the latter being used as the datum.

wall flame-type oil burner — an oil burner in which oil in a liquid stream is fed against a ring or wall inside the combustion chamber. (Refer to oil burner.)

wall furnace — a furnace installed in or on a wall or partition, supplying warm air through grilles, boots, or the equivalent, without the use of ducts. (Refer to furnace.)

PERCENTAGE RATINGS

BLOCK A **SAFETY AND SAFE WORK PRACTICES**

Task 1 Practices safety and maintains a safe work environment.

BLOCK B **INSTALLATION OF OIL BURNING AND OIL-COMBINATION BURNING EQUIPMENT AND APPLIANCES**

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	30	10	40	30	ND	ND	ND	ND	ND	ND	NV	15	25%

Task 2 Installs oil liquid medium heating appliances.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	20	30	25	25	ND	ND	ND	ND	ND	ND	NV	33	27%

Task 3 Installs oil-combination liquid medium heating appliances.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	15	5	10	5	ND	ND	ND	ND	ND	ND	NV	5	8%

Task 4 Installs oil warm air heating appliances.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	20	30	25	22	ND	ND	ND	ND	ND	ND	NV	30	25%

Task 5 Installs oil-combination warm air heating appliances.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	15	5	15	13	ND	ND	ND	ND	ND	ND	NV	10	12%

Task 6 Installs waste oil burners.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	5	0	5	10	ND	ND	ND	ND	ND	ND	NV	2	4%

Task 7 Installs fuel supply to oil burning equipment.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	25	30	20	25	ND	ND	ND	ND	ND	ND	NV	20	24%

BLOCK C **SERVICE AND MAINTENANCE OF OIL BURNING AND OIL-COMBINATION BURNING EQUIPMENT AND APPLIANCES**

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	60	60	50	47	ND	ND	ND	ND	ND	ND	NV	50	53%

Task 8 Conditions oil burning equipment and appliances annually.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	15	30	20	33	ND	ND	ND	ND	ND	ND	NV	25	25%

Task 9 Conditions oil-combination burning equipment and appliances annually.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	10	5	10	8	ND	ND	ND	ND	ND	ND	NV	5	7%

Task 10 Troubleshoots, repairs and replaces burners and components.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	15	30	20	20	ND	ND	ND	ND	ND	ND	NV	30	23%

Task 11 Troubleshoots, repairs and replaces controls.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	15	15	20	17	ND	ND	ND	ND	ND	ND	NV	8	15%

Task 12 Troubleshoots, repairs and replaces warm-air appliances.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	15	10	15	10	ND	ND	ND	ND	ND	ND	NV	15	13%

Task 13 Troubleshoots, repairs and replaces liquid medium appliances.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	30	10	15	12	ND	ND	ND	ND	ND	ND	NV	17	17%

BLOCK D RETROFIT OF EXISTING EQUIPMENT

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	10	30	10	23	ND	ND	ND	ND	ND	ND	NV	35	22%

Task 14 Evaluates existing system and plans new system.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	40	34	25	33	ND	ND	ND	ND	ND	ND	NV	20	30%

Task 15 Removes existing equipment.

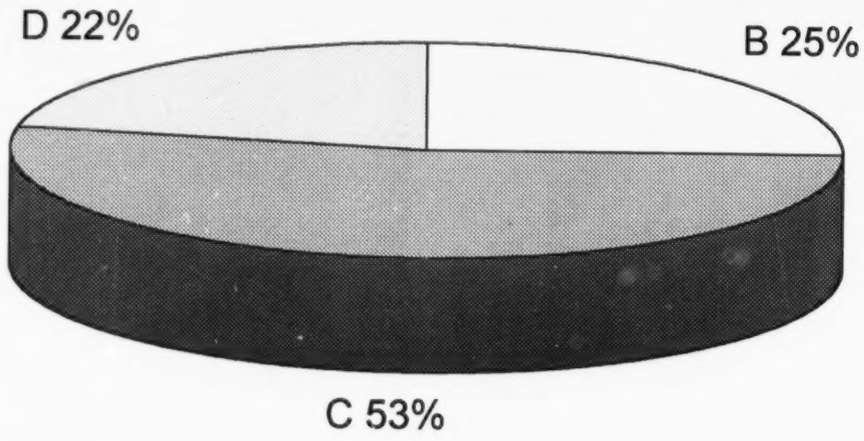
%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	20	33	25	30	ND	ND	ND	ND	ND	ND	NV	20	26%

Task 16 Installs retrofit system.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	40	33	50	37	ND	ND	ND	ND	ND	ND	NV	60	44%

BLOCK PERCENTAGES

BLOCK PERCENTAGES*
Oil Burner Mechanic



* The average time a worker spends performing each block in a given year in relation to other blocks of the analysis, taking into consideration the complexity (importance plus difficulty) of the block.

TITLES OF BLOCKS

A **SAFETY AND SAFE WORK PRACTICES****

B **INSTALLATION OF OIL BURNING AND OIL-COMBINATION BURNING EQUIPMENT AND APPLIANCES**

C **SERVICE AND MAINTENANCE OF OIL BURNING AND OIL-COMBINATION BURNING EQUIPMENT AND APPLIANCES**

D **RETROFIT OF EXISTING EQUIPMENT**

** Since safety practices are a mandatory feature of all occupations, they are considered common core, ratings are not required and thus Block A does not appear on the chart.

OIL BURNER MECHANIC (1997)

APPENDIX " E "

	BLOCKS	TASKS	SUB-TASKS										
A	**Safety and Safe Work Practices**	**1.** Practices safety and maintains a safe work environment.	1.01 Evaluates work site conditions and identifies hazards.	1.02 Practices good housekeeping.	1.03 Maintains tools in safe operating condition.	1.04 Uses and wears personal protection equipment.	1.05 Uses hand and power tools in a manner that ensures safety of self and others.	1.06 Works on scaffolds and ladders.	1.07 Operates emergency safety equipment.	1.08 Assures protection from fire hazard.	1.09 Assures protection from electrical shock.	1.10 Handles, stores and properly disposes of hazardous materials.	1.11 Uses proper rigging and hoisting procedures.
			1.12 Recognizes warning signs and danger tags.	1.13 Identifies and properly labels energized equipment.	1.14 Applies cardiopulmonary resuscitation (CPR) and basic first aid.	1.15 Observes limits of approach to high voltage equipment.	1.16 Operates electrical testing equipment safely.	1.17 Operates powder actuated tools in safe manner.	1.18 Interprets government regulations and safety standards.	1.19 Complies with company safety regulations.	1.20 Completes written safety and injury reports.	1.21 Reports injuries to immediate supervisor.	1.22 Demonstrates safe work practice in all work activities.
			1.23 Uses gas detection devices.	1.24 Works safely around pressurized components.	1.25 Works safely with fuels.	1.26 Operates motor vehicles.	1.27 Notifies officials of spills and initiates containment.	1.28 Recognizes and responds to air quality environmental concerns.	1.29 Performs all tasks in a safe, competent and professional manner.				
B	**Installation of Oil Burning and Oil Combination Burning Equipment and Appliances**	**2.** Installs oil liquid medium heating appliances.	2.01 Determines British thermal unit (Btu) requirements for application.	2.02 Evaluates location of installation.	2.03 Evaluates suitability of oil burner appliance to installation.	2.04 Consults with customer on choice of appliance.	2.05 Prepares materials list to satisfy installation requirements.	2.06 Prepares site for proper installation of appliance.	2.07 Verifies adequate supply of air to support combustion.	2.08 Lays out installation in accordance with standards and codes.	2.09 Assembles equipment and materials on site.	2.10 Assembles appliance according to manufacturer's specifications.	2.11 Positions appliance.
			2.12 Squares and levels appliance.	2.13 Performs pressure test of appliance.	2.14 Repairs or replaces appliance or components.	2.15 Coordinates installation of required services with other trades.	2.16 Connects appliance to electrical service.	2.17 Connects appliance to water system.	2.18 Installs side wall venting.	2.19 Verifies adequate venting capacity of chimney.	2.20 Connects appliance to venting system.	2.21 Connects appliance to fuel supply.	2.22 Fills appliance with appropriate heating medium.
			2.23 Tests sequence and operation of all controls.	2.24 Verifies adequate fuel supply and pressure to burner.	2.25 Starts burner according to manufacturer's recommendations.	2.26 Adjusts and calibrates burner for proper operation, using approved testing equipment and combustion analysis techniques.	2.27 Tests installation for safe and proper operation.	2.28 Explains operation of appliance to customer/ operator.	2.29 Completes required documentation.				
		3. Installs oil-combination liquid medium heating appliances.	3.01 Determines Btu requirements for application.	3.02 Evaluates location of installation.	3.03 Evaluates suitability of oil burner appliance to installation.	3.04 Consults with customer on choice of appliance.	3.05 Prepares materials list to satisfy installation requirements.	3.06 Prepares site for proper installation of appliance.	3.07 Verifies adequate supply of air to support combustion.	3.08 Lays out installation in accordance with standards and codes.	3.09 Assembles equipment and materials on site.	3.10 Assembles appliance according to manufacturer's specifications.	3.11 Positions appliance.
			3.12 Squares and levels appliance.	3.13 Performs pressure test of appliance.	3.14 Repairs or replaces appliance or components.	3.15 Coordinates installation of required services with other trades.	3.16 Connects appliance to electrical service.	3.17 Connects appliance to water system.	3.18 Installs side wall venting.	3.19 Verifies adequate venting capacity of chimney.	3.20 Connects appliance to venting system.	3.21 Connects appliance to fuel supply.	3.22 Fills appliance with appropriate heating medium.

*** = (NOT COMMON CORE)**

OIL BURNER MECHANIC (1997)

BLOCKS **TASKS** ← **SUB-TASKS** →

		3.23 Tests sequence and operation of all controls.	3.24 Verifies adequate fuel supply and pressure to burner.	3.25 Starts burner according to manufacturer's recommendations.	3.26 Adjusts and calibrates burner for proper operation, using approved testing equipment and combustion analysis techniques.	3.27 Tests installation for safe and proper operation.	3.28 Explains operation of appliance to customer/operator.	3.29 Completes required documentation.			
4. Installs oil warm air heating appliances.		4.01 Determines Btu requirements for application.	4.02 Evaluates location of installation.	4.03 Consults with customer on choice of appliance.	4.04 Prepares materials list to satisfy installation requirements.	4.05 Prepares site for proper installation of appliance.	4.06 Verifies adequate supply of air to support combustion.	4.07 Lays out installation in accordance with standards and codes.	4.08 Assembles equipment and materials on site.	4.09 Assembles appliance according to manufacturer's specifications.	4.10 Positions appliance.	4.11 Squares and levels appliance.
		4.12 Coordinates installation of required services with other trades.	4.13 Connects appliance to electrical service.	4.14 Connects appliance to venting system.	4.15 Connects appliance to fuel supply.	4.16 Tests sequence and operation of all controls.	4.17 Verifies adequate fuel supply to burner.	4.18 Starts burner according to manufacturer's recommendations.	4.19 Adjusts and calibrates burner for proper operation.	4.20 Tests, adjusts and balances blower system.	4.21 Installs power humidifiers and electrostatic air cleaners.	4.22 Installs side wall venting.
		4.23 Balances air volume.	4.24 Tests installation for safe and proper operation.	4.25 Explains operation of appliance to customer/operator.	4.26 Completes all required documentation.							
5. Installs oil-combination warm air heating appliances.		5.01 Determines Btu requirements for application.	5.02 Evaluates location of installation.	5.03 Consults with customer on choice of appliance.	5.04 Prepares materials list to satisfy installation requirements.	5.05 Prepares site for proper installation of appliance.	5.06 Verifies adequate supply of air to support combustion.	5.07 Lays out installation in accordance with standards and codes.	5.08 Assembles equipment and materials on site.	5.09 Assembles appliance according to manufacturer's specifications.	5.10 Positions appliance.	5.11 Squares and levels appliance.
		5.12 Coordinates installation of required services with other trades.	5.13 Connects appliance to electrical service.	5.14 Connects appliance to venting system.	5.15 Connects appliance to fuel supply.	5.16 Tests sequence and operation of all controls.	5.17 Verifies adequate fuel supply to burner.	5.18 Starts burner according to manufacturer's recommendations.	5.19 Adjusts and calibrates burner for proper operation.	5.20 Tests, adjusts and balances blower system.	5.21 Installs power humidifiers and electrostatic air cleaners.	5.22 Installs side wall venting.
		5.23 Balances air volume.	5.24 Tests installation for safe and proper operation.	5.25 Explains operation of appliance to customer/ operator.	5.26 Completes all required documentation.							
6. Installs waste oil burners.		6.01 Determines appropriate size of burner to meet customer requirements.	6.02 Evaluates location of installation.	6.03 Prepares materials list to satisfy installation requirements.	6.04 Prepares site for proper installation of equipment.	6.05 Verifies adequate supply of air to support combustion.	6.06 Lays out installation in accordance with standards and codes.	6.07 Assembles equipment and materials on site.	6.08 Assembles appliance according to manufacturer's specifications.	6.09 Positions appliance.	6.10 Squares and levels appliance.	6.11 Coordinates installation of required services with other trades.

* = (NOT COMMON CORE)

OIL BURNER MECHANIC (1997)

BLOCKS	TASKS	SUB-TASKS
		6.12 Connects appliance to electrical service.*
		6.13 Connects appliance to venting system.
		6.14 Connects appliance to fuel supply.
		6.15 Connects appliance to special air supply as required by manufacturer.
		6.16 Tests sequence and operation of all controls.
		6.17 Verifies adequate fuel supply and pressure to burner.
		6.18 Starts burner according to manufacturer's recommendations.
		6.19 Adjusts and calibrates burner for proper operation.
		6.20 Tests installation for safe and proper operation.
		6.21 Tests, adjusts and balances blower assembly.
		6.22 Explains operation and safety features of appliance to customer.
		6.23 Explains hazards of waste oil and foreign materials to customer.
		6.24 Explains and demonstrates routine appliance maintenance requirements to customer.
		6.25 Completes all required documentation.
	7. Installs fuel supply to oil burning equipment.	7.01 Determines fuel consumption requirements of oil burning system.
		7.02 Determines fuel storage requirements.
		7.03 Determines appropriate fuel storage location.
		7.04 Determines appropriate fuel distribution system for application.
		7.05 Designs fuel distribution plan for approval.
		7.06 Prepares materials list to satisfy installation requirements.
		7.07 Prepares site for proper installation of fuel distribution equipment.
		7.08 Determines proper pump and pipe capacities to satisfy fuel supply requirements.
		7.09 Lays out installation in accordance with standards and codes.
		7.10 Assembles equipment and materials on site.
		7.11 Performs visual inspection of all components.
		7.12 Positions and installs fuel storage tank according to code and local environmental regulations.
		7.13 Installs piping.
		7.14 Performs appropriate testing procedures on tanks and piping.
		7.15 Installs safety devices.
		7.16 Completes piping connections.
		7.17 Checks storage tanks.
		7.18 Purges and checks fuel distribution system.
		7.19 Tests, adjusts and balances fuel distribution system.
		7.20 Installs overflow piping on pressurized systems.
		7.21 Installs oil filter assembly.
		7.22 Labels and codes piping.
		7.23 Completes required documentation.
C **Service and Maintenance of Oil Burning and Oil-Combination Burning Equipment and Appliances**	**8.** Conditions oil burning equipment and appliances annually.	8.01 Checks previous documentation for maintenance history.
		8.02 Consults with customer to identify problems and history.
		8.03 Observes system operation.
		8.04 Inspects and cleans heat exchanger surfaces.
		8.05 Cleans and/or replaces vent pipes or prefab chimney bases.
		8.06 Cleans and/or replaces air filters.
		8.07 Replaces nozzle.
		8.08 Cleans and/or replaces electrode assembly.
		8.09 Cleans and/or replaces burner air gate, housing and fan.
		8.10 Cleans and/or replaces flame sensing device.
		8.11 Cleans and/or replaces exterior of burner and appliance.
		8.12 Cleans and/or replaces oil filter cartridge.
		8.13 Checks and cleans blower assembly.
		8.14 Checks and lubricates motors, seals and pumps.
		8.15 Checks and replaces couplings.
		8.16 Checks ignition systems and adjusts to manufacturer's specifications.
		8.17 Tests fuel unit pump pressure and cutoff pressure.
		8.18 Checks and replaces fuel pump strainer and gasket.
		8.19 Checks condition of combustion chamber and repairs or replaces.
		8.20 Checks and corrects all oil leaks.
		8.21 Cleans fuel pump and lines.
		8.22 Checks exterior of oil tank for corrosion, leaks or blistering.
		8.23 Checks interior of oil tank for contaminants.
		8.24 Checks fill pipes, vent pipes, fuel gauges and exposed oil lines for leaks.
		8.25 Checks safety timing and proper operation of all controls.
		8.26 Operates burner and adjusts fire using combustion testing equipment.
		8.27 Repairs, adjusts and replaces units and components.
		8.28 Completes required documentation.

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OIL BURNER MECHANIC (1997)

BLOCKS	TASKS	SUB-TASKS
	9. Conditions oil-combination burning equipment and appliances annually.	9.01 Checks previous documentation for maintenance history.
		9.02 Consults with customer to identify problems and history.
		9.03 Observes system operation.
		9.04 Inspects and cleans heat exchanger surfaces.
		9.05 Cleans and/or replaces vent pipes or prefab chimney bases.
		9.06 Cleans and/or replaces air filters.
		9.07 Replaces nozzle.
		9.08 Cleans and/or replaces electrode assembly.
		9.09 Cleans and/or replaces burner air gate, housing and fan.
		9.10 Cleans and/or replaces flame sensing device.
		9.11 Cleans and/or replaces exterior of burner and appliance.
		9.12 Cleans and/or replaces oil filter cartridge.
		9.13 Checks and cleans blower assembly.
		9.14 Checks and lubricates all motors, seals and pumps.
		9.15 Checks and replaces couplings.
		9.16 Checks ignition systems and adjusts to manufacturer's specifications.
		9.17 Tests fuel unit pump pressure and cutoff pressure.
		9.18 Checks and replaces fuel pump strainer and gasket.
		9.19 Checks condition of combustion chamber and repairs or replaces.
		9.20 Checks and corrects all oil leaks.
		9.21 Cleans fuel pump and lines.
		9.22 Checks exterior of oil tank for corrosion, leaks or blistering.
		9.23 Checks interior of oil tank for contaminants.
		9.24 Checks fill pipes, vent pipes, fuel gauges and exposed oil lines for leaks.
		9.25 Checks safety timing and proper operation of all controls.
		9.26 Operates burner and adjusts fire using combustion testing equipment.
		9.27 Repairs, adjusts and replaces units and components.
		9.28 Completes required documentation.
	10. Troubleshoots, repairs and replaces burners and components.	10.01 Consults with customer to identify problems and history.
		10.02 Determines possible causes of problems.
		10.03 Performs visual inspection of system.
		10.04 Checks power supply.
		10.05 Checks fuel supply.
		10.06 Checks proper operation of controls.
		10.07 Checks fuel supply at burner.
		10.08 Checks ignition system.
		10.09 Checks fuel nozzle.
		10.10 Checks for flooded combustion chamber.
		10.11 Checks for adequate air supply to support combustion.
		10.12 Checks for blockages in flue passages, combustion chamber and venting system.
		10.13 Repairs, adjusts and replaces units and components.
		10.14 Starts burner.
		10.15 Ensures proper operation of burner by conducting combustion tests.
		10.16 Completes required documentation.
	11. Troubleshoots, repairs and replaces controls.	11.01 Consults with customer to identify problems and history.
		11.02 Determines possible causes of problems.
		11.03 Performs visual inspection of system.
		11.04 Checks power supply.
		11.05 Checks for proper operation of each control.
		11.06 Repairs, adjusts, calibrates and replaces control.
		11.07 Starts system.
		11.08 Ensures proper operation of controls.
		11.09 Completes required documentation.
	12. Troubleshoots, repairs and replaces warm-air appliances.	12.01 Consults with customer to identify problems and history.
		12.02 Determines possible causes of problems.
		12.03 Performs visual inspection of system.
		12.04 Checks heat exchanger for integrity.
		12.05 Checks venting system for leaks or blockages.
		12.06 Checks combustion chamber for integrity.
		12.07 Checks blower assembly and filters.
		12.08 Checks air distribution system for blockages.
		12.09 Repairs, adjusts and replaces units and components.
		12.10 Starts system.
		12.11 Ensures proper operation of burner by conducting combustion tests.
		12.12 Checks power humidifiers and electrostatic air cleaners.
		12.13 Completes required documentation.

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OIL BURNER MECHANIC (1997)

BLOCKS	TASKS	SUB-TASKS
	13. Troubleshoots, repairs and replaces liquid medium appliances.	13.01 Consults with customer to identify problems and history.
		13.02 Determines possible causes of problems.
		13.03 Performs visual inspection of system.
		13.04 Checks heat exchanger for integrity.
		13.05 Checks venting system for leaks or blockages.
		13.06 Checks combustion chamber for integrity.
		13.07 Checks circulating pumps and pump components for proper operation.
		13.08 Checks system temperature and pressure.
		13.09 Checks expansion tank and air purgers.
		13.10 Checks distribution system for proper operation.
		13.11 Repairs, adjusts and replaces units and components.
		13.12 Verifies concentration and adds freeze protection agent.
		13.13 Starts appliance.
		13.14 Ensures proper operation of appliance by performing combustion tests.
		13.15 Completes required documentation.
D **Retrofit of Existing Equipment**	**14.** Evaluates existing system and plans new system.	14.01 Performs visual inspection of system.
		14.02Verifies appliance or equipment to be retrofitted for safe connection using the present firebox or refractory material relining.
		14.03 Analyzes system.
		14.04 Evaluates customer's expectations.
		14.05 Determines scope of work to be performed and costs involved.
		14.06 Presents proposal to customer for approval.
		14.07 Completes required documentation.
		14.08 Submits plans to necessary agencies for approval.
	15. Removes existing equipment.	15.01 Coordinates removal activities with customer.
		15.02 Disconnects services.
		15.03 Isolates work area.
		15.04 Disassembles and removes existing equipment.
		15.05 Coordinates proper disposal of equipment.
		15.06 Cleans up site.
	16. Installs retrofit system.	16.01 Prepares site for retrofitting.
		16.02 Installs appliances and/or equipment.